

This is the tenth newsletter from the steering group of the Sustainability Transitions Research Network. The newsletter is divided into the following sections:

- Words from the Chairman
- Environmental Innovation and Societal Transitions
- Network news
- Event announcement
- New research projects
- Publications

We welcome all members to submit news items for the next newsletter. You can use the website [www.transitionsnetwork.org](http://www.transitionsnetwork.org) (submit projects, output or news), or send a message to [sustainabilitytransitions@gmail.com](mailto:sustainabilitytransitions@gmail.com). The advantage of using the website for submission is that the information also becomes available online.

The STRN steering group

## Words from the Chairman

Dear transition research colleagues,

As the year is coming to an end, we can look back on a very successful year with the 4<sup>th</sup> International Sustainability Conference in Zurich, diffusion of our thinking into mainstream policy bodies (the OECD is doing a project on System Innovation, and the UNEP is latching on to transitions theory), continued high-quality papers in our 'house' journal (Environmental Innovation and Societal Transition), a high number of publications in an increasing variety of journals, the launch of Making Transitions Happen (a practitioner-oriented program by Climate-KIC), various successful proposals in the FP-7 round on transitions to sustainable societies, and many projects, workshops and conference presentations. So, the sustainability transitions community is doing very well, and we can all be proud of our achievements and activities. One of the papers in the publications section (Chappin and Ligvoet, 2014) shows that we have created a fairly cohesive and integrated community of scholars, who meet each other at workshops and conferences, and read and cite each other's work.

This reading of each other's work is getting more complicated as transition scholars are increasingly publishing in a wider variety of journals. This development should be welcomed, however, because it shows that we are engaging with debates in mainstream environmental journals. This diversification may also alleviate some previously-expressed concerns that the transition community is getting too inward oriented (which is a common phenomenon when research communities become institutionalized). The publications section in this newsletter shows that we still publish in influential innovation studies journals (e.g. *Research Policy*; *Technological Forecasting and Social Change*; *Technology Analysis & Strategic Management*), where some of the early influential transition papers were published. But it also shows that the community is moving out of the innovation-niche, as evidence by publications in journals such as *Global Environmental Change*; *Journal of*

*Cleaner Production; Renewable and Sustainable Energy Reviews; Energy Policy; Journal of Consumer Culture; Building Research and Information; Area; Journal of Environmental Policy & Planning; Environment and Planning A; Environment and Planning C; Urban Studies; Journal of Transport Geography; Information Systems Research.* This diversification does, of course, make it difficult to 'keep up' with the literature, because one cannot read all these different journals. The publication section in the STRN-newsletter can play an important role in this respect, namely by keeping members of the transitions community informed about the transition-related outputs in various journals.

I hope that the diversification of transitions thinking will be as influential in other disciplines and journals as it has already been in innovation studies. One indication of this success is that three STRN-members (Jochen Markard, Bernard Truffer, Frank Geels) have each received a publication award from IAMOT (see under 'Network news') for their publications in innovation studies journals in the last 5 years. Another indication that sustainability transitions research has had a pervasive impact is that it accounts for many of the most-cited papers in innovation studies journals (available on the journal websites).

\* In *Technology Analysis & Strategic Management* there are 10 papers on sustainability transitions in the top-20 of most cited papers (all years). 7 of these papers are in the top-11.

\* In *Technological Forecasting and Social Change*, there are 7 papers on sustainability transitions in the top-25 of papers with most citations in the last 5 years (since 2008). 3 of these papers are in the top-10.

\* In *Research Policy*, there are 6 papers on sustainability transitions in the top-25 of papers with most citations in the last 5 years (since 2008). 4 of these papers are in the top-10.

This impressive citation impact suggests that transitions research has become one of the major research areas in the innovation studies field. I hope that transition research will have similar effects in other academic fields (e.g. geography, sustainability, energy studies, transport studies, agro-food studies) in the coming years.

Another encouraging development visible in this newsletter is the internationalization of transition research. The various news items show an increasing number of papers and projects in countries such as India, Canada, Malaysia, Israel, Australia, United States, Czech Republic, Latin America, Thailand, and Laos. This internationalization is not only encouraging for our academic community (moving beyond the European focus), but also socially and politically important since many sustainability problems have global characteristics.

I hope these reflections stimulate you to read this newsletter, which is again full of conference announcements, workshop reviews, new research projects, and interesting publications, both in EIST and many other journals. I wish you all a happy Christmas and a very interesting and productive 2014,

**Frank Geels**, Chairman of STRN ([frank.geels@mbs.ac.uk](mailto:frank.geels@mbs.ac.uk))

## Environmental Innovation and Societal Transitions

Volume 9 of "Environmental Innovation and Societal Transitions" has just been published. It is a special issue on "Energy, materials and growth" containing articles in honour of professor Robert U. Ayres. The contributions to this special issue provide connections to relevant insights in related fields, namely Ecological Economics and Industrial Ecology, which allows enriching the research on environmental innovation and societal transitions. Many of the contributions end with clear suggestions for transitions policy. The following articles are included:

Jeroen C.J.M. van den Bergh, 2014, Robert Ayres, Ecological Economics and Industrial Ecology, *Environmental Innovation and Societal Transitions*, 9, 1-7

Robert U. Ayres, Colin J. Campbell, Thomas R. Casten, Paul J. Horne, Reiner Kümmel, John A. Laitner, Uwe G. Schulte, Jeroen C.J.M. van den Bergh, Ernst U. von Weiszäcker, 2013, Sustainability transition and economic growth enigma: Money or energy?, *Environmental Innovation and Societal Transitions*, 9, 8-12

Colin J. Campbell, 2014, Recognising the Second Half of the Oil Age, *Environmental Innovation and Societal Transitions*, 9, 13-17

Thomas R. Casten, 2013, A theory of ossification of energy services, *Innovation and Societal Transitions*, 9, 18-25

J. Paul Horne, 2013, Climate change and economic growth enigma: An investment suggestion from Wall Street, *Environmental Innovation and Societal Transitions*, 9, 26-32

Reiner Kümmel, 2013, Why energy's economic weight is much larger than its cost share, *Environmental Innovation and Societal Transitions*, 9, 33-37

John A. "Skip" Laitner, 2014, An overview of the energy efficiency potential, *Environmental Innovation and Societal Transitions*, 9, 38-42

Uwe G. Schulte, 2014, New business models for a radical change in resource efficiency, *Environmental Innovation and Societal Transitions*, 9, 43-47

Ernst U. von Weiszäcker, Robert U. Ayres, 2014, Boosting resource productivity: Creating ping-pong dynamics between resource productivity and resource prices, *Environmental Innovation and Societal Transitions*, 9, 48-55

Another news item is that Giorgos Kallis will step down in the coming months as associate editor of EIST. I would like to thank Giorgos for his hard work in the last few years and welcome Harald Rohrer - professor of Technology and Social Change at Linköping University in Sweden - who will join the editorial team!

**Jeroen van den Bergh, Editor-in-Chief [jeroen.bergh@uab.es]**

## Network News

*Any news related to ongoing activities of STRN*

### **Research awards for Jochen Markard, Bernard Truffer and Frank Geels**

The International Association of Management of Technology (IAMOT) has given research awards to three scholars from the STRN-network (Markard, Truffer and Geels). These research awards recognize the recipients as being among the top 50 authors in innovation studies journals over the last 5 years (based on a quantitative analysis of publications from 2008-2012).

**Frank Geels (frank.geels@mbs.ac.uk)**

### **Third Prize Innovation Essay Competition for Stijn van Ewijk**

The paper "Re-inventing the multi-level perspective for technological transitions: a more rigorous tool for analysis and two case studies" by Stijn van Ewijk received a third prize in the Innovation Essay Competition held by the Centre for Technology, Innovation and Culture at the University of Oslo. The jury called it a "bold and ambitious attempt to 're-invent' an established theoretical framework, used within the subject area of sustainability transitions". The paper addresses some of the issues with the multi-level perspective and suggests a modified framework that substitutes the regime-niche divide for a regime model based on levels of competition. The novel approach is exemplified with the cases of solar energy and wind energy in the electricity sector. The paper can be found [here](#).

## Event announcements

*Calls for upcoming relevant events such as workshops and conferences*

### **5th International Sustainability Transitions (IST) Conference August 27-29, 2014 Utrecht, The Netherlands**

The 5th anniversary of the International Sustainability Transitions (IST) Conference will be organized by Utrecht University. The IST conference is *the* conference for scholars in the sustainability transitions community. The key theme of this year's conference is *Impact and*

*Institutions* and we are excited to announce keynote lectures by Raghu Garud, Johan Schot, Marjan Minnesma, and Simon Kavanagh. For more information on the conference, keynote lectures, side events and the beautiful city of Utrecht please visit [www.ist2014.com](http://www.ist2014.com). The deadline for full paper submission is March 15, 2014 and we are looking forward to welcoming all of you in Utrecht.

### **Call for papers: Transitions session at European Geoscience conference 27 April-2 May 2014**

Global change processes cause a large challenge for society. Significant changes in some of our current ways of living are necessary in order to not transgress important natural boundaries. For example, CO<sub>2</sub> emissions need to be drastically reduced to avoid severe effects from climate change. These changes in society are likely to cause an overall transition of the socio-ecological system. We (Dominik E. Reusser, Diego Rybski, Jürgen Kropp, Dominik Wiedenhofer, Marina Fischer-Kowalski and Antonio Ferreira) want to advance this discussion at the next assembly of the European Geoscience Union (EGU), as a platform to present scientific approaches, consolidate existing knowledge and facilitate a collaboration between disciplines. More details on our session ERE1.10 "Sustainability transitions of the socio-ecologic system" can be found

here: <http://meetingorganizer.copernicus.org/EGU2014/session/14174>

EGU 2014 takes place in Vienna from April 27-May 02. Deadline for submissions is January 16th.

For more information contact: Dominik Reusser [reusser@pik-potsdam.de]

### **Call for papers: Global Transitions to Sustainable Production and Consumption Systems, Fudan University, Shanghai, China, June 8–11, 2014**

This [Second Biennial Conference of the Global Research Forum on Sustainable Production and Consumption](#) provides a unique opportunity for Chinese and Asian SPaC researchers and practitioners to join together with others in the global community. The event will be an opportunity to present and discuss new research outcomes from the Asia-Pacific region, as well as from Latin America, Africa, Europe, and North America. The conference will take stock of new issue framings and explore emerging research questions. The scope will cover local and global issues and interconnections across scales, linking regions and researchers. One of the aims is to strengthen the international community of SPaC researchers and practitioners and to open channels of communication with knowledge users in policy making, business, and civil society.

The conference will feature presentations by currently confirmed keynote speakers: Bill Rees, Zhu Dajian, Ashish Kothari, and Zhang Zongyi. Other announcements on this front will be forthcoming. Parallel sessions will integrate across regions and seek to forge global collaborations with other global networks. The conference will also include a poster session and further details about this part of the program are available on the conference website. Interested participants are invited to submit abstracts for papers and essays as well as session proposals by December 15. For further details, please visit the conference [website](#). For information about GRF-SPaC, click on the [link](#) or email to [grfspac@gmail.com](mailto:grfspac@gmail.com).

## **Event Reviews**

*Review of events interesting to the STRN community*

### **United Nations climate change conference in Warsaw (COP19), 11-22 November 2013**

Under the radar of most media reports, this year's UN [climate change conference in Warsaw](#) continued on a subtle trend toward a more comprehensive understanding of low-carbon transition processes in general and the explicit use of concepts from transition research in particular, with transition language infusing much of the discussions, several events dedicated to transition research, and new institutional developments opening up

opportunities for transition researchers across the spectrum. The annual conferences under the United Nations Framework Convention on Climate Change (UNFCCC) are well known for the long and difficult, often frustrating negotiation sessions on a new global 'climate deal'. Less well known is that the UNFCCC also strives to provide space and time during the two-weeks sessions for researchers to engage with government officials, NGOs and civil society. Besides the negotiation tracks, around 175 official side events and another 100+ events in country pavilions and other side venues provided ample opportunities for the 8,300 participants to learn from countries' experiences, discuss research findings and collectively advance the understanding of the challenges and opportunities ahead. Several of these events were organized by members of the transition community, including a seminar by Tsinghua University on "China's Low Carbon Transition Research" in the Chinese Pavilion; an event by the International Research Network for Low Carbon Societies (LCS-RNet) on "Transition to Low-Carbon Resilient Societies: From Theory to Reality" in the Japanese Pavilion; and an official side event on "Beyond Technology Transfer" jointly organized by the Sussex Energy Group (University of Sussex, Brighton) and SusTec (ETH Zurich). Others covered specific cases using transition concepts and frameworks – several events were dedicated to sectoral transitions in energy, agriculture, and transport, for example – or explored the implications from transition research for low-carbon transformations in developing countries. While there is certainly still much room for more, the concepts of low-carbon innovation, technological capabilities, low-carbon transitions and innovation systems are now much more salient in presentations, formal and informal discussions, and the negotiations itself than they were just a few conferences ago. This is also reflected in several recent negotiation outcomes, such as the functions and objectives of the newly established Technology Mechanism under the UNFCCC or, more broadly, in the integration into the anticipated global framework of national policies that reflect country-specific needs and circumstances (in contrast to a one-size-fits-all global climate policy). These developments can be seen as both a corroboration of the policy relevance of transition research and a reason for the community to engage even more intensively with the UNFCCC process in the future. **Joern Huenteler (jhuenteler@ethz.ch)**

#### **Workshop on multi-level governance in transitions towards low carbon growth**

From 20-22 November, 2013, Jadavpur University (Kolkata, India) organised an international Workshop on Multi-level Governance in Transition Processes towards Low Carbon Growth. Researchers from Indian and European universities discussed the role of state actors, non-state actors and sub-national authorities in governing low carbon transitions. The innovation biography of photovoltaics in Germany was discussed to understand how policy regimes determine the evolution of social-technical regimes and what India can learn in its attempt towards transition. For more information, please contact: **Joyashree Roy** [joyashreeju@gmail.com]

#### **Workshop on solar PV and mobility experiments in India**

From 12-15 November 12-15, 2013, Jadavpur University (Kolkata, India) organised an international workshop on sustainability impact of solar PV and mobility experiments in India. Researchers from Indian and European universities (e.g. Eindhoven, Amsterdam, Chiang Mai University, Jadavpur University, Sussex University, Policy Studies Institute) discussed experiments and alternative transition trajectories in solar-PV and mobility, including standalone solar PV based lighting system, solar cities, walking, cycling, hybrid cars, and BRTS. Possible trajectories were explored with multi-criteria mapping tools and deliberation among stakeholders, which deepened the understanding of uncertainties and implementation challenges. For more information, please contact: **Joyashree Roy** [joyashreeju@gmail.com]

## New research projects

*Information about ongoing research activities such as the start of new research projects*

### **The role of the renewable resources based on biomass in the shift towards a bio-based economy**

STAR\*Agro Energy is a EU FP-7 research project coordinated by University of Foggia (Italy), which involves a trans-disciplinary research group that integrates researchers from the areas of: Complex Environmental Systems, Agricultural Economics, Green Chemistry & Engineering, Agronomy & Ecology and Commodity Sciences. STAR\*AgroEnergy aims at providing a general methodology to deal with renewable energy generation derived from agriculture and agri-food industries and to promote a knowledge based bio-economy, according to sustainability criteria. Within the general framework of sustainability transitions towards a bio-based economy, our research group in the area of Complex Environmental Systems is investigating the new value chains of the renewable resources based on biomass, the roles of stakeholders and the influence of the financial context at different decision making levels. The project is developing along the following three lines of research: (1) gaining a deeper understanding of the sources of pressure acting at the landscape level – this goes through the identification of the key stakeholders involved in the transition process as well as the channels through which they exert pressure; (2) assessing the mechanisms through which technological niches evolve into mature configurations able to replace the existing regime – this is done through social network analysis as the niche is a network of dedicated actors itself; (3) defining a meta-model able to combine the first two elements in a comprehensive framework meant to provide insights on the regime shift. The results of our research activities will contribute to the development of STAR \*AgroEnergy general methodology. For more information about the project please contact Piergiuseppe Morone ([p.morone@gmail.com](mailto:p.morone@gmail.com)).

### **Scenarios and Pathways for a Low-carbon Built Environment in Australian Cities**

This 4-year project of the Australian Cooperative Research Centre (CRC) for Low Carbon Living aims to explore and articulate visions, scenarios and policy pathways for a low carbon built environment through a collaborative, trans-disciplinary approach which incorporates research, engagement and action. The project will utilise research and a range of creative engagement strategies to gather stakeholder views of desirable future possibilities for Australian cities. The project will characterise possible futures, understand and analyse socio-technical innovations to realise them, identify policy, research, investment and governance implications, and test visioning approaches that best communicate such transitions. Future low carbon living scenarios will be translated into communicable visions that will be promoted through the CRC and its partners to build enthusiasm and take-up. Transition pathways for achieving these visions will be investigated in order to overcome barriers and manage the complex dynamics of resource/material, technical, economic, social and behavioural aspects of urban living. Policy measures and governance structures for achieving these visions will be identified. The project is led by Victorian Eco-Innovation Lab of University of Melbourne. For more information contact Chris Ryan [cryan@unimelb.edu.au](mailto:cryan@unimelb.edu.au) or Idil Gaziulusoy [igaziulusoy@unimelb.edu.au](mailto:igaziulusoy@unimelb.edu.au)

### **The turn to ecological transition in the environmental discourse in Québec since 2008**

This 2-year project initiates the study of sustainability transitions in Québec through the analysis of the turn to “ecological transition” in environmental discourse. While the idea of an ecological transition broadly refers to a process of deep technological and infrastructural transformations through eco-innovation, its discursive definition remains contentious regarding public policies and governmental interventionism, the types of technologies to implement, and the role of various social actors ranging from grassroots social movements to entrepreneurs and investors. The indefiniteness of the transition discourse is a feature of an emerging discourse that, in the Québec context, seems to stem from a tactical

appropriation of the international discussions on the transition to a green or low-carbon economy. At a moment where Québec is faced with the issue of its expected role in the development of the pipelines network for Canadian tar sand fuels, these trends are crucial to analyse since new discourses are expected to influence policy making. The project thus aims at describing the discursive turn to ecological transition in Québec and at understanding the conflicts that it sustains through the analysis of five types of actors: provincial and local governments, businesses and corporate lobbies, trade unions, environmental NGOs and grassroots social movements. Among the specific objectives feature a contribution to the field of sustainability transitions by strengthening the input of discourse analysis, and the introduction of sustainability transitions in French language science. For more information, please contact **René Audet** [[audet.rene@uqam.ca](mailto:audet.rene@uqam.ca)]

### **TRANSIT (TRANSformative Social Innovation Theory)**

TRANSIT (TRANSformative Social Innovation Theory) is a new research project that will develop a theory of transformative social innovation, by studying how (networks of) social innovation contribute to systemic societal change. Examples of case-studies include *Living Knowledge* science shops, time banks, *Makerspaces* and *FabLabs*, *Transition Towns*, eco-villages and energy cooperatives. TRANSIT studies how these phenomena operate through 20+ transnational networks across Europe and Latin America. A main research question is how people are (dis)empowered in contributing to systemic change in the context of a rapidly changing world that faces 'game changing' developments such as e.g. economic crises, climate change and the ICT-revolution. The aim is to build a theory of transformative social innovation that is useful not only to academics, but also to practitioners. TRANSIT aspires to create an iterative interplay between interdisciplinary theory formation, empirical research through in-depth fieldwork and statistical analysis, and a transdisciplinary translation to practical insights and capacity building tools. TRANSIT is an EC-funded FP7 research project coordinated by DRIFT (Erasmus University Rotterdam, the Netherlands), and involves twelve research institutes from across Europe and Latin-America. Contact: scientific coordinators **Flor Avelino** ([avelino@drift.eur.nl](mailto:avelino@drift.eur.nl)) and **Julia Wittmayer** ([wittmayer@drift.eu.nl](mailto:wittmayer@drift.eu.nl)). For more information see: <http://www.drift.eur.nl/?p=7176>.

## **Publications**

*Announcement of new publications such as article, PhD theses and books*

### **PhD thesis: Mattijs Smits, *Electricity, modernity and sustainability: A critical scalar analysis of energy transitions in Thailand and Laos* (School of Geosciences, The University of Sydney)**

This thesis addresses the apparent tensions between modernity and sustainability in energy transitions through analysis of power sector developments at different scales in Thailand and Laos. The first key argument of this study is that the production and consumption of energy are intimately related to discourses of modernity and processes of state-formation and territorialisation in these two countries, albeit in different ways. The thesis further argues that these developments should be understood in the context of increasingly important regional (plans for) trade and cooperation in electricity driven by neoliberal discourses originating with the multi-lateral banks and ASEAN. The second key argument of this thesis is that energy developments are embedded in local social, political and geographical relations. To demonstrate this, four local case studies are analysed as energy trajectories, stressing the embedded and contingent nature of changing energy systems by focusing on energy practices. In addition, this thesis demonstrates how each case is constructed as 'iconic case' by different actors through the enrolment of material and discursive elements that cut across scales. The main conclusion of this thesis is that energy, modernity and sustainability are constituted at different scales. As such, it challenges the universalistic and linear assumptions underpinning notions of 'energy transitions' and makes the case for 'energy trajectories', stressing embeddedness, contingency and multiplicity. It also argues for a

reinvigorated geography of energy and provides a basis for understanding how dominant discourses of energy-modernity may be challenged by discourses of alternative energy-modernities.

**PhD thesis: Dena Fam, 2013, *People and Practices: Fostering transitions toward sustainability through transdisciplinary inquiry and individual, social and organisational learning*, University of Technology Sydney**

Integral to the process of transitioning toward sustainability are 'people and practices' and the importance of the human dimensions associated with technological change. Practices in this thesis are discussed at the level of *using* novel technologies (implicating end-users) and the level of *planning, designing and managing* the installation of novel socio-technical systems (implicating project teams). Complementary to the overarching framework of transition management, this transdisciplinary perspective of 'practices' draws on literature from practice theory, social and organisational learning and communities of practice.

Six case studies of transitions in sanitation, over three cycles of research, provide insight into how transitions have *historically occurred, are occurring at present and might be more readily facilitated in the future*. The diverse range of cases span temporal (historical and real-time cases), geographic (local and international cases) and spatial (community and city scale cases) scales with a primary focus on the emergence of nutrient recovery and reuse systems in wastewater management (urine diversion systems) in Sweden and Australia.

The sociological perspective adopted to study transitions in sanitation revealed the complex relationship between sanitation technologies, and the users/consumers and managers/providers of these systems. The thesis also identifies principles for designing experiments to support social learning in transdisciplinary projects inclusive of end-users, processes for engaging end-users in adopting new practices through social learning, and methods for translating individual learning into organisational learning and change by organisations trialling sustainable innovation. For more information please

contact: [Dena.Fam@uts.edu.au](mailto:Dena.Fam@uts.edu.au)

**Special issue about 'grassroots innovation', in *Global Environmental Change*, 2013, Vol. 23, Issue 5**

Smith, A. and Seyfang, G., 2013, Constructing grassroots innovations for sustainability, *Global Environmental Change*, 23(5), 827-829

Kirwan, J., Ilbery, B., Maye, D., Carey, J., 2013, Grassroots social innovations and food localisation: An investigation of the Local Food programme in England, *Global Environmental Change*, 23(5), 830-837

White, R. and Stirling, A., 2013, Sustaining trajectories towards Sustainability: Dynamics and diversity in UK communal growing activities, *Global Environmental Change*, 23(5), 838-846

Hess, D.J., 2013, Industrial fields and countervailing power: The transformation of distributed solar energy in the United States, *Global Environmental Change*, 23(5), 847-855

Ornetzeder, M. and Rohracher, H., 2013, Of solar collectors, wind power, and car sharing: Comparing and understanding successful cases of grassroots innovations, *Global Environmental Change*, 23(5), 856-867

Hargreaves, T., Hielscher, S., Seyfang, G., and Smith, A., 2013, Grassroots innovations in community energy: The role of intermediaries in niche development, *Global Environmental Change*, 23(5), 868-880

Seyfang, G. and Longhurst, N. 2013, Desperately seeking niches: Grassroots innovations and niche development in the community currency field, *Global Environmental Change*, 23(5), 881-891

**Racherla, P and Mandivawalla, M., 2013, Moving from access to use of the information infrastructure: A multilevel sociotechnical framework, *Information Systems Research*, 24(3), 709-730**



Universal access (UA) to the Internet and the associated information infrastructure has become an important economic and societal goal. However, UA initiatives tend to focus on issues such as physical access and geographical ubiquity, and they measure adoption through penetration rates. In this paper, we apply an interpretive case study approach to analyze the Philadelphia wireless initiative to provide insights into the nature of UA and extend this concept to also consider universal use (UU). UU is important because simply providing access does not guarantee use. UU is presented as a conceptual goal that starts with the challenge of physical access, but which necessarily also leads to considerations of use. The results show that the human and technological elements underlying individual access and use are deeply embedded within various institutional elements and collectives that enable but also constrain meaningful use. We integrate our findings into a multilevel framework that shows how access and use are influenced by both micro and macro factors. This framework provides new insights into the study of the information infrastructure, digital divide, and public policy.

**Crabbe, A., Jacobs, R., Van Hoof, V. Bergmans, A. and Van Acker, K., 2013, Transition towards sustainable material innovation: evidence and evaluation of the Flemish case, *Journal of Cleaner Production*, 56, 63-72**

In this article, we focus on testimonies on recent sustainable material innovations in 15 Flemish production firms. We look at evidence of transition towards sustainable material innovation, considering: (1) how material innovation can improve the sustainability of products and processes with respect to people, planet and profit and (2) what are stimulating and hindering factors met when adopting sustainable material innovation. Trends observed from assessing the sustainability features of the individual material innovation cases are presented in 3P evaluation grids. A meta-analysis of the testimonies considers drivers and barriers for sustainable material innovation on the level of technological niches, socio-technical regimes and socio-technical landscapes, referring to the multi-level perspective used in transition literature. It was found that the interplay between these levels has been key in all the assessed cases. Stimulated by the increasing scarcity and rising prices of raw materials, a growing eco-sensitivity among their customers, and the downright need for economic survival, production companies turn to look for more innovative ways of using materials in order to arrive at more sustainable products and production processes.

**Fuenfschilling, L. and Truffer, B., 2013, The structuration of socio-technical regimes—Conceptual foundations from institutional theory, *Research Policy*, forthcoming**

In recent years, socio-technical transitions literature has gained importance in addressing long-term, transformative change in various industries. In order to account for the inertia and path-dependency experienced in these sectors, the concept of the socio-technical regime has been formulated. Socio-technical regimes denote the paradigmatic core of a sector, which results from the co-evolution of institutions and technologies over time. Despite its widespread acceptance, the regime concept has repeatedly been criticized for lacking a clear operationalization. As a consequence, empirical applications tend to depict regimes as too 'monolithic' and 'homogenous', not adequately considering persistent institutional tensions and contradictions. These are however crucial for assessing transition dynamics. In this paper, we revisit two concepts from institutional theory that enable an explicit identification of socio-technical regimes and more generally a specification of the 'semi-coherence' of socio-technical systems. First, we will show that 'levels of structuration' can be conceptualized as degrees of institutionalization, thereby treating institutionalization as a variable with different effects on actors, the stability of the system and thus the potential for change. Secondly, we draw on the institutional logics approach to characterize the content of various structural elements present in a system and to trace conflicts and contradictions between them. We illustrate this approach with an empirical in-depth analysis of the transformation of the Australian urban water sector since the 1970ies.

**Crivits, M. and Paredis, E., 2013, Designing an explanatory practice framework: Local food systems as a case, *Journal of Consumer Culture*, 13(3), 306-336**

This article elaborates an explanatory framework for the role of consumption practices in transitions to (enhanced) sustainability in the food system. To develop an applied practice approach we combine the concept of practice' with that of niche/regime', adopted from contemporary sociology and transitions theory, respectively. This re-combination adds to the field of applied consumption research and describes consumption beyond the boundaries of individualist and structuralist models, as well as integrates a conceptualization of the a-linear reproduction of aligning and competing consumer practices. We illustrate the methodology by showing its application drawing on data of a niche in the Belgian food system. Elaborating on the social practice model based on Giddens ((1984) *The Constitution of Society*. Cambridge: Polity Press), Bourdieu ((1976) *Outline of a Theory of Practice*. New York: Cambridge University Press) and Spaargaren and Van Vliet ((2000) *Lifestyles, consumption and the environment: The ecological modernisation of domestic consumption*. *Environmental Politics* 9(1): 50-76), we designate a three-tiered framework that endeavours to describe consumption practices in terms of everyday routines and habits, integrating an agency perspective with a dual perspective on structure. Consumer interviews and focus groups combined with a system analysis of the context of the alternative food practice allowed a schematization of what it implies to be a carrier of the niche practice. The practice schematizations of this niche are then considered vis-a-vis a schematization of the regime practice. The comparison shows two essential aspects: it points out that (1) although qualitative and systemic differences are found between niche and mainstream practices, in both cases the perception of the carriers (i.e. consumers) on what they need to do is to an equal extent normalized, and (2) empirical results indicate that central conceptions in the contemporary food consumption discourse, such as convenience, can in real life be redrawn by entirely different sets of interconnected routines. We reflect on the methodology and give suggestions as to how consumption governance could orientate towards practices as complementary to the traditional focus on individual consumer behaviour and consumer norm targets.

**Turnheim, B. and Geels, F.W., 2013 'The destabilisation of existing regimes: Confronting a multi-dimensional framework with a case study of the British coal industry (1913-1967)', *Research Policy*, 42(10), 1749-1767**

Because innovation studies are oriented towards novelty, scholars in this field have paid less attention to the destabilisation of *existing* regimes. This paper discusses four views on industry destabilisation and presents an encompassing conceptual framework, which addresses interactions between the build-up of external pressures, industry response strategies, and the gradual weakening of commitment to existing regime elements. We confront the framework with an in-depth longitudinal case study of the British coal industry (1913–1967). Specific conclusions are developed about different degrees of regime inertia, the ebb and flow of external pressures, the relative importance of economic and socio-political pressures, and interactions between them.

**Smith, A., Kern, F., Raven, R., and Verhees, B., 2013, Spaces for sustainable innovation: Solar photovoltaic electricity in the UK, *Technological Forecasting & Social Change*, 81, 115-130**

This paper engages with recent research concerning the roles of niche spaces in the strategic management of sustainable innovations. Whilst a growing body of empirical investigation looks to developments within these spaces, it is surprising how little pauses to consider how the spaces themselves develop over time, what constitutes these spaces, and how their characteristics influence sustainable innovation. We explore such questions through a case study into the history of solar photovoltaic electricity generation over the last 40 years in the UK. Whilst we see evidence consistent with recent ideas about niche spaces shielding, nurturing, and empowering sustainable innovation, the main thrust of our analysis concludes that this arises in contested and compromised ways. Moreover, our analysis

identifies niche space developing through the political ability of technology advocates recursively interpreting, representing, and negotiating between the content and contexts of innovation.

**Temmes, A., Räsänen, R.-S., Rinkinen, J. and Lovio, R., 2013, The emergence of niche protection through policies: The case of electric vehicles field in Finland, *Science & Technology Studies*, 26(3), 37-62**

The literature of Strategic Niche Management has rarely discussed how the SNM policies come to amend the existing policies. Through an in-depth study on the development of electric vehicles field in Finland, we show, firstly, how niche actors mobilize protection by policies for their technology through systematic expectations work, and, secondly, how the politicians strategically select technologies to be protected. By zooming in on the emergence and impact of two major policy initiatives, we show that systematic expectations work is characterized by the credibility of enactors and expectations, as well as systematic advocacy and publicity work. We contribute to the SNM literature by showing how policy actions develop through systematic expectations work, as well as continued interaction between enactors and selectors within well-functioning public-private arenas.

**Romero-Lankao, P. and Gnatz, D.M., 2013, Exploring urban transformations in Latin America, *Current Opinion in Environmental Sustainability*, 5(3-4), 358-367**

The question of how to transform behaviors, systems, cultures and institutions to move to more sustainable and resilient cities has received increased attention among scholars and decision makers. However, while sustainability and resilience are increasingly becoming core issues for different strands of scholarship, the strategies for affecting change toward more sustainable and resilient urban centers remain elusive. We use a combination of elements from socio-technical transition theory and political ecology and two Latin American cities (Mexico City and Manizales) to suggest a framework for an analysis of urban transitions in Latin America. The two cities were faced with similar triggers and pressures to create sustainability and resilience and each acted within a time of sweeping international movements. In both cases, networks of actors introduced innovative responses to their own particular set of pressures, constraints and opportunities and attempted to expand nature's life-supporting features such as ecosystem and hydrological services, while reducing threats from hazards such as floods. Yet the innovations that took place in the two cities presented very different results with regard to regime transition. Interestingly, Mexico City's success at creating an urban regime change seems to have been based on the use of a top-down approach as it was driven mainly by actors within the existing power structure with access to the power and the resources of an authoritarian state. By contrast, actors in Manizales have been largely outside the power structure and had less success in creating a city-wide transformation. This highlights the importance of power structure dynamics that can promote or prevent transformations from within or impede transformations from without.

**Meelen, T. and Farla, J., 2013, Towards an integrated framework for analysing sustainable innovation policy, *Technology Analysis & Strategic Management*, 25(8), 957-970**

An integrated framework for the analysis of sustainable innovation policy was developed, based on a combination of the transition management (TM) framework, the strategic niche management approach, and policy recommendations, resulting from technological innovation system (TIS) studies. In the framework, the multi-level view from TM has been integrated with the functions approach from the TIS literature. The integrated policy framework shows that specific policy goals and measures can be found at the specific points of intervention related to (the interfaces between) landscape, regime, TIS and niches. The integrated framework suggests that stimulation of a TIS only makes sense when this action is well aligned with landscape and regime developments. The framework should be used in empirical studies for further testing and refinement.

**Chappin, E.J.L. and Ligvoet, A., 2014, Transition and transformation: A bibliometric analysis of two scientific networks researching socio-technical change, *Renewable and Sustainable Energy Reviews*, 30, 715–723**

Sustainability policy in the early 2000s is based on and therefore influenced by scientific literature on 'transition'. The importance of this link has inspired the authors to explore the structure of cooperating authors and citation networks in the field. In order to understand 'transition' literature, we compare it with an alternative term for change, 'transformation', which is also used in the context of socio-technical shifts towards sustainability. We expose the different structures of these fields with an overview of keywords, key references, key authors, and the coherence between references and authors. By analysing co-author and citation networks, we find large differences in these groups of documents. The transition literature is characterised by a large network of directly and indirectly cooperating authors with clear clusters; transformation literature contains smaller author networks. Key transition authors are predominantly Dutch. They repeatedly write together and cite each other's work. The transition literature is tightly knit with high degrees of internal references and a clearly distinguishable core. Transformation literature has fewer connections between authors and articles. The connecting articles, each with many global citations, form its basis. This analysis can be used as a step to continue the debate on the role of transition and transformation literature in sustainability and renewable energy policy. The transformation literature teaches us that older streams of thought are still relevant and may be used as 'glue' for linking change with respect to sustainable energy to wider developments. Rediscovering existing literature in new combinations may lead to promising new views on sustainable energy.

**Hansen, U.E., Nygaard, I. (2013): Sustainable energy transitions in emerging economies: The formation of a palm oil biomass waste-to-energy niche in Malaysia 1990–2011. *Energy Policy*, forthcoming.**

The economic development in emerging economies in Southeast Asia has significantly increased the use of fossil fuel based energy. This has severe implications for global climate change, and against this background, scholars within the sustainable transition tradition have taken an interest in addressing how transitions towards more sustainable development pathways in this region may be achieved. This paper contributes to the abovementioned literature by examining the conducive and limiting factors for development and proliferation of a palm oil biomass waste-to-energy niche in Malaysia during the period 1990–2011. Rising oil prices, strong pressure on the palm oil industry from environmental groups, and a persisting palm oil biomass waste disposal problem in Malaysia appear to have been conducive to niche proliferation, and on top of this national renewable energy policies and large-scale donor programmes have specifically supported the utilisation of palm oil biomass waste for energy. However, in spite of this, the niche development process has only made slow progress. The paper identifies reluctant implementation of energy policy, rise in biomass resource prices, limited network formation and negative results at the niche level, as the main factors hindering niche development.

**Hess, D.J., 2013, Sustainability transitions: A political coalition perspective, *Research Policy*, forthcoming**

In the case of technology transitions to low-carbon sources of energy, there is growing evidence that even in countries with a strong political consensus in favor of a transition, the pace has been slow in comparison with the need to reduce greenhouse gases. One factor that affects the slowness of the transition is political resistance from the incumbent industrial regime. Using data on the mobilization of resistance from the fossil-fuel industry in the United States, the study builds on the growing literature on the political dimensions of sustainability transitions by drawing attention to the role of incumbent regime coalitions, grassroots coalitions in support of green transition policies, and countervailing industrial power. Case studies of political coalitions for ballot propositions in the U.S. are used to show

how countervailing industrial power, especially from the technology and financial sector, can tip the balance of electoral spending in favor of grassroots organizations.

**Gee, S. and Uyarra, E., 2013, A role for public procurement in system innovation: the transformation of the Greater Manchester (UK) waste system, *Technology Analysis & Strategic Management*, 25(10), 1175-1188**

The transformation of socio-technical systems to more sustainable states is more policy induced than market driven. Reflecting this, the potential for governments to direct system transformation has been widely debated. However, this debate concentrates on supply side policies and under analyses the potential for public buyers to steer system innovation. This paper draws from ideas on system innovation, transition management and public procurement to explore how a major public buyer was able to do just this. The paper describes the transformation of the Greater Manchester (UK) waste system from a relatively simple landfill model to a highly complex, multi-technology solution of intensive recycling, composting and energy production. The paper draws three main conclusions: (1) it is possible to orchestrate system innovation through public procurement in certain circumstances; (2) this involves developing the required interdependencies between technologies, institutions and practices; (3) system transformation can be orchestrated from within the incumbent regime.

**Klitkou, A. and Godoe, H., 2013, The Norwegian PV manufacturing industry in a Triple Helix perspective. *Energy Policy*. (Vol. 61) pp. 1586–1594**

For the benefit of our common future, policies aimed at the development and promotion of renewable energy technologies should be based on a Triple Helix approach with a sense of technological agency. This view is supported by a case study on the emergence and development of a Norwegian solar photovoltaic manufacturing industry. The data and analyses demonstrate how this new industry was fostered by interactions between existing companies, public R&D funding programmes and research organisations and policy contexts; illustrating a policy-driven technological agency in accordance with a Triple Helix innovation process. During the last decade, a solar PV manufacturing industry has emerged in Norway and gone on to a 10 to 20 per cent share of various segments of world markets for solar PV feedstock, wafers and related components. The present financial crisis has caused an investment slump in solar PV installations, especially in Europe. Therefore, the future prospects for the Norwegian solar PV industry are at risk despite of its focus on innovation and R&D, and its technological agency. Political action is needed: (1) creation of market incentives in near markets for the deployment of solar PV, (2) international cooperation for boosting deployment of solar PV in developing countries.

**Vreugdenhil, R. and Williams, S., 2013, White line fever: a sociotechnical perspective on the contested implementation of an urban bike lane network, *Area*, 45(3), 283-291**

In this paper we discuss the introduction of the Launceston Bike Network, a local government project progressed in Tasmania, Australia. The project's implementation became subject to intense community conflict, or what we refer to here as white line fever because it arose in relation to the white traffic lines used to mark the on-road bike lanes. Our analysis of textual data gathered from relevant documents and interviews with key stakeholders relies on the development of a sociotechnical perspective. Adopting this perspective allows us to recognise the various agencies emerging collectively from the technical and social aspects and interactions analysed. The findings add to how cycling and infrastructure might be reconceptualised as an urban sociotechnical system, and assist in its transition towards the transport mainstream through policy and planning.

**Eames, M., Dixon, T. May, T., 2013, City futures: exploring urban retrofit and sustainable transitions, *Building Research and Information*, 41(5), 504-516**

Cities are responsible for up to 70% of global carbon emissions and 75% of global energy consumption. By 2050 it is estimated that 70% of the world's population will live in cities. The

critical challenge for contemporary urbanism, therefore, is to understand how to develop the knowledge, capacity and capability for public agencies, the private sector and multiple users in city-regions (i.e. the city and its wider hinterland) to re-engineer systemically their built environment and urban infrastructure in response to climate change and resource constraints. To inform transitions to urban sustainability, key stakeholders' perceptions were sought through a participatory backcasting and scenario foresight process in order to illuminate challenging but realistic socio-technical scenarios for the systemic retrofit of core UK city-regions. The challenge of conceptualizing complex urban transitions is explored across multiple socio-technical regimes' (housing, non-domestic buildings, urban infrastructure), scales (building, neighbourhood, city-region), and domains (energy, water, use of resources) within a participatory process. The development of three archetypal guiding visions' of retrofit city-regional futures developed through this process are discussed, along with the contribution that such foresight processes might play in opening up' the governance and strategic navigation of urban sustainability.

**Upham, P., Kivimaa, P., Virkamäki, V. (2013) Path dependency in transportation system policy: a comparison of Finland and the UK, *Journal of Transport Geography* 32, 12–22.**

This paper investigates path dependence and path creation in transport policy and related innovation policy in the case of Finland and the UK. The paper uses document content analysis and elite interviews, drawing on literatures on the relationship of institutional and policy path dependency to technological expectations and images of the policy problem. We find that although policy expectations and visions of transport system innovation are still very much focused on motor vehicle technology change in both countries, particularly technological substitution, there are nonetheless indications of acceptance of transport demand reduction policies, which in turn may be regarded as a form of social innovation. Given the importance of transport demand reduction as part of GHG emissions and congestion reduction strategies, there is a need to better understand how policy for social innovation is entering the sphere of transport and related innovation policy and how these processes might be supported.

**Kiparsky, M., Sedlak, D., Thompson, B. H., Truffer B. 2013. The innovation deficit in urban water: the need for an integrated perspective on institutions, organizations, and technology. *Environmental Engineering Science* 30 (8), 395-408.**

The interaction between institutional change and technological change poses important constraints on transitions of urban water systems to a state that can meet future needs. Research on urban water and other technology-dependent systems provides insights that are valuable to technology researchers interested in assuring that their efforts will have an impact. In the context of research on institutional change, innovation is the development, application, diffusion and utilization of new knowledge and technology. This definition is intentionally inclusive: technological innovation will play a key role in reinvention of urban water systems, but is only part of what is necessary. Innovation usually depends on context, such that major changes to infrastructure include not only the technological inventions that drive greater efficiencies and physical transformations of water treatment and delivery systems, but also the political, cultural, social, and economic factors that hinder and enable such changes. On the basis of past and present changes in urban water systems, institutional innovation will be of similar importance to technological innovation in urban water reinvention. To solve current urban water infrastructure challenges, technology-focused researchers need to recognize the intertwined nature of technologies and institutions and the social systems that control change.

**Taylor, P.G., Bolton, R., Stone, D. and Upham, P., 2013, Developing pathways for energy storage in the UK using a coevolutionary framework, *Energy Policy*, 63, 230–243**

A number of recent techno-economic studies have shown that energy storage could offer significant benefits to a low-carbon UK energy system as it faces increased challenges in matching supply and demand. However, the majority of this work has not investigated the real-world issues affecting the widespread deployment of storage. This paper is designed to address this gap by drawing on the systems innovation and socio-technical transitions literature to identify some of the most important contextual factors which are likely to influence storage deployment. Specifically it uses a coevolutionary framework to examine how changes in ecosystems, user practices, business strategies, institutions and technologies are creating a new selection environment and potentially opening up the energy system to new variations of storage for both electricity and heat. The analysis shows how these different dimensions of the energy regime can coevolve in mutually reinforcing ways to create alternative pathways for the energy system which in turn have different flexibility requirements and imply different roles for storage technologies. Using this framework three pathways are developed – user led, decentralised and centralised – which illustrate potential long-term trajectories for energy storage technologies in a low-carbon energy system.

**Teschner, N. and Paavola, J., 2013, Discourses of abundance: Transitions in Israel's energy regime, *Journal of Environmental Policy & Planning*, 15(3), 447-466**

This article examines an on-going socio-technical transition of the Israeli energy regime. This transition includes a shift away from a discourse about the scarcity of energy to a discourse on its abundance. The emerging regime is centred on natural gas, oil shale, nuclear energy and solar energy as alternatives to coal and oil. Despite the uncertainties and complexities that still constrain these new energy alternatives, perceived abundance of energy has several ramifications for the socio-technical transition of the Israeli energy regime, including its future pathways, technological trajectories and institutional arrangements. We examine these ramifications by analysing the transition through the analytical lens of discursive institutionalism in order to highlight the less visible aspects of the transition, such as conflicting values, hidden interests, restricted pathways, social unease and compromised sustainability.

**Rydin, Y., Turcu, C., Guy, S. and Austin, P., 2013, 'Mapping the coevolution of urban energy systems: Pathways of change', *Environment and Planning A*, 45, 634-649**

The interface of a long-standing movement for sustainability at the urban scale and the imperatives of the carbon-reduction agenda are driving change in urban energy systems. This paper seeks to address the nature of that change and, in particular, to consider how different pathways of change are emerging. To do this it draws on the coevolution and pathways literatures to interrogate a database of current urban energy initiatives within the UK. This analysis reveals the multiple pathways of change through which new modes of energy production and consumption are being developed to deliver carbon reductions through the reconfiguring of urban energy systems. The paper concludes with a discussion of the implications of these changes for urban governance and for carbon reductions.

**Petrova, S., Posová, D., House, A. and Sýkora, L., 2013, Discursive framings of low carbon urban transitions: The contested geographies of 'satellite settlements' in the Czech Republic, *Urban Studies*, 50(7), 1439-1455**

The discursive and representational aspects of the multiple political, economic and cultural challenges associated with low carbon urban transitions remain insufficiently explored in the academic literature. This is particularly true in the post-communist states of eastern and central Europe, which have been undergoing an additional transition of their own—from a centrally planned to a market-based economy. This paper, therefore, explores the manner in which climate change and sustainability narratives have been implicated in the development of 'satellite settlements'—a specific form of sprawl present in the Czech Republic. Much of the paper is focused on investigating the discursive framings of such areas by relevant state policies and the national media in this country. Several key themes and discursive shifts in

the representation of satellite settlements have been detected. Such changes may be connected to wider interactions among the dynamics of post-communist and low-carbon urban transition.

**Audet, R. and Guyonnaud, M.-F., 2013, Transition in practice and action in research. A French case study in piloting eco-innovations, *Innovation: The European Journal of Social Science Research*, forthcoming**

Transition in practice means that diverse organizations – from private foundations to citizen-led movements for “cities in transition” – are experiencing ways to bring about sustainable transitions at the system level. While academic thinking on sustainability transitions can efficiently inform transition in practice, these organizations’ initiatives can enrich the analytic understanding of transitions. It is this mutually beneficial tradeoff that became the purpose of the action research project with the French private foundation Fondaterra, and which led to the drafting of Fondaterra’s own model in piloting eco-innovations towards transition. This paper outlines the main features of the Fondaterra model: the territorial perspective, the idea of piloting change, espousing prospective visions, creating new chains of value, implementing demonstrators and monitoring. The comparison of this model with the transition management model suggests that the latter may resonate with other intervention methodologies that have been developed with strong concern for governance strategies, and that many configurations of transition in practice led.

**Trutnevyte E., 2014, The allure of energy visions: Which visions are better than others? *Energy Strategy Reviews*, in press**

Energy visions, which define the desirable state of the future energy system, are used by leaders and other societal actors in developing energy strategies. Low-carbon energy, 100% renewable energy system and 2000 W society are examples of such visions. While all visions sound appealing and promising, they also tend to be ‘black box’-like and gloss over the potential negative consequences. A good vision needs to be both socially viable and analytically sound. This paper describes an approach for comparing several visions from quantitative analytical and qualitative social perspectives. This approach, based on the EXPANSE methodology, also allows for eliciting the commonalities (overlaps) and fundamental differences of various visions. The method is illustrated by comparing three visions of heat and electricity supply in a Swiss municipality. All three visions have their strengths and weaknesses and there is hardly a single best vision. Even if several visions differ substantially in their qualitative narrative, they can still overlap in their implementation options (energy scenarios) and consequences. Thus, there is no pressing need to try to develop only a single best vision as multiple visions may overlap and can co-exist.

**Steinmueller, W.E., 2013, The pre-industrial energy crisis and resource scarcity as a source of transition, *Research Policy*, 42(10), 1739-1748**

The historical British ‘timber famine’ of the 18th century is re-examined in the light of contemporary concerns about transitions in energy use. The alternatives of scarcity-induced and opportunity-led transition are considered in relation to the economics of sustainable fuel timber production for industrial uses. The paper finds that the production of timber was an economically sustainable use of land and that observations of timber shortages may have therefore either been claims made by interests favouring the use of coal or the consequence of abandonment of fuel timber cultivation in favour of coal use. The longer-term sustainability of domestic UK sources for industrial timber fuel timber is shown to be problematic. The consequences of the alternative views of the ‘timber famine’ for contemporary policies attempting to promote transition to low carbon or sustainable energy use are examined. In particular, if the present is an echo of the past, opportunity rather than crisis may be the more powerful lever of change.

**Stephens, J.C., Wilson, E.J., Peterson, T.R., Meadowcroft, J. 2013. Getting smart? Climate change and the electric grid. *Challenges* 4(2): 201-216.**

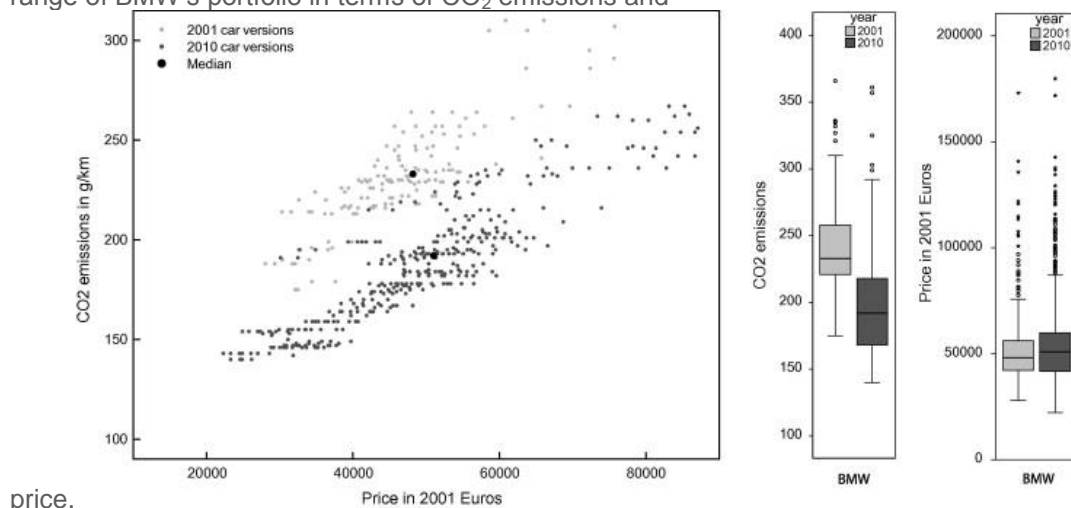


Interest in the potential of smart grid to transform the way societies generate, distribute, and use electricity has increased dramatically over the past decade. A smarter grid could contribute to both climate change mitigation and adaptation by increasing low-carbon electricity production and enhancing system reliability and resilience. However, climate goals are not necessarily essential for smart grid. Climate change is only one of many considerations motivating innovation in electricity systems, and depending on the path of grid modernization, a future smart grid might do little to reduce, or could even exacerbate, risks associated with climate change. This paper identifies tensions within a shared smart grid vision and illustrates how competing societal priorities are influencing electricity system innovation. Co-existing but divergent priorities among key actors' are mapped across two critical dimensions: centralized versus decentralized energy systems and radical versus incremental change. Understanding these tensions provides insights on how climate change objectives can be integrated to shape smart grid development. Electricity system change is context-specific and path-dependent, so specific strategies linking smart grid and climate change need to be developed at local, regional, and national levels. And while incremental improvements may bring short term gains, a radical transformation is needed to realize climate objectives.

**Van der Vooren, A., Alkemade, F., and Hekkert, M.P., 2013, Environmental performance and firm strategies in the Dutch automotive sector. *Transportation Research Part A: Policy and Practice* 54, 111-126, 2013**

The paper explores how automotive firms positioned their portfolio since the introduction of energy labels for cars. Using data on product characteristics of automobiles offered on the Dutch market over the period 2001-2010, we analyse how car manufacturers' product portfolios have changed. Portfolio changes by the top 15 car manufacturers in the Netherlands are analysed. Though the analysis shows that manufacturers move in a similar direction towards a portfolio with cleaner vehicles, the different manufacturers have chosen very different portfolio management strategies. In particular the manufacturers that followed a portfolio strategy of relatively large propulsion efficiency improvements without large weight changes increased their sales numbers compared to other car manufacturers. Manufacturers lagging behind with CO<sub>2</sub> emission reduction performed weak in terms of sales.

**Figure:** Left: overview of BMW's portfolio in 2001 and 2010. Right: boxplots provide an overview of range of BMW's portfolio in terms of CO<sub>2</sub> emissions and



**Kivimaa, P., Virkamäki, V., 2013. Policy mixes, policy interplay and low carbon transitions: The case of passenger transport in Finland. *Environmental Policy and Governance*, forthcoming**

The promotion of low-carbon transport systems is largely dependent on the interplay between technology, innovation, markets, people's behaviour and policy. Various policies

jointly influence the development of transport systems, some policies implying different or even contradictory designs for future transport systems. Policy interplay has not been much addressed in previous research on sustainability transitions. This article combines the technological innovation system (TIS) functions, within the transitions framework, with policy analysis to empirically map multiple policies and their intended paths towards low-carbon transport systems. Empirically, the article provides a systematic review of Finnish national-level policies for transport and transport-related innovation. The discussion examines the contribution of the current policy mix to sustainability transitions based on its degree of attempt to re-design the transport system. The findings reveal that policy support is more comprehensive regarding more energy-efficient vehicles and low-carbon fuels than based on reduced transport demand or alternative transport modes. A holistic policy approach towards low-carbon transitions is only achieved to a degree and innovation policy gaps are identified.

**Schroeder H, Burch S, Rayner S, 2013, "Novel multisector networks and entrepreneurship in urban climate governance" *Environment and Planning C: Government and Policy* 31(5) 761 – 768**

The papers in this theme issue seek to advance our understanding of the roles of networks and partnerships in the multilevel governance of climate change and related issues in the urban context. In particular, the papers examine the roles of nontraditional actors and apply emerging theoretical approaches such as sustainability transitions theory to gain a greater understanding of the variety of approaches being employed around the world, as well as the transformative potential of these approaches. We discuss the role of the state relative to the roles of local leadership, knowledge systems, and community-wide collaborative engagement in bringing about sustainability transitions.

**Killip, G., 2013, Transition management using a market transformation approach: lessons for theory, research, and practice from the case of low-carbon housing refurbishment in the UK', *Environment and Planning C: Government and Policy* 31(5) 876 – 892**

Work on target-led transitions has highlighted the interdependence between 'niche' and 'regime' actors in steering change towards strategic goals. Similarly, market transformation (MT) has a long history in product markets, improving the energy efficiency of stocks of energy-using appliances through research, minimum standards, energy labels, incentives, procurement, competitions, and stakeholder networks. Attempts to apply MT to buildings have failed to fully take account of the differences between appliance markets and the multiple markets which frame energy use in buildings. The case of refurbishment of UK housing is considered here, for which there is a system of different markets in operation. MT principles are considered in relation to the sources and diffusion of innovation in project-based industries; the management of different expectations among innovators and incumbents; technical risks associated with doing low-carbon refurbishment work; and the role of policy in simultaneously stimulating supply and demand. An iterative process with feedback loops and coordination is proposed to link training, standard-setting, and compliance checks. No institutional infrastructure exists for such an enterprise, which would need to cross established boundaries between regime actors. The case of UK housing refurbishment throws up lessons for theory, research, and practice which could be developed through further case studies.

**Scheck, H., Vallentin, D., and Venjakob, J. (eds.), 2013, *Emscher 3.0: From grey to blue - or, how the blue sky over the Ruhr region fell into the Emscher***

The river Emscher is the symbol of one of the internationally most renowned industrial regions: the Ruhr area with its 5 million inhabitants and an important location of key industries such as steel, chemical and materials industry. The revitalisation of the Emscher over the last 20 years marks a new phase in the region's history and is an impressive example of ecological and socio-economic transformation affecting all aspects of life along

the river. What can we learn from the Emscher conversion for upcoming tasks in other infrastructure fields? This book is not a strictly scientific publication but rather an illustrative book for a broader audience about the river Emscher, which used to be one of the most heavily polluted 'industrial rivers' in the Ruhr area and has been re-natured over the past 20 years. In the book it is shown how this eco-engineering project has amounted to a much broader socio-economic and cultural transformation in the context of structural change in an industrial region. It looks at the role of governance processes and structures and the way that people living alongside the river have been included in the process. The book, edited by the Wuppertal Institute, is available in English and can be downloaded here: <http://epub.wupperinst.org/frontdoor/index/index/docId/5070>.

**Aylett A, 2013, "Networked urban climate governance: neighborhood-scale residential solar energy systems and the example of Solarize Portland" *Environment and Planning C: Government and Policy* 31(5) 858 – 875**

With this paper I investigate the role of civil society groups in speeding the urban adoption of green technologies (in particular, renewable energy systems) by creating economic niches, and catalyzing market transformations. I focus on a qualitative case study of Solarize Portland, a community-managed solar energy program that has transformed the local and regional market for solar energy in Portland, OR. This case study is analyzed through the lens of recent theories of public participation that emphasize the multiplicity and complexity of participatory processes in practice. I conclude that—thanks to their flexibility, risk tolerance, and locally embedded understanding of technological change—civil society groups have the capacity to design and implement significant urban sustainability projects. They achieve this by creating niches within the urban landscape that allow local small and medium-sized enterprises to develop and refine their businesses practices; by coordinating novel partnerships between state, community, and private-level actors; and by grounding technological change in the broader social networks that give them meaning and momentum. These findings speak directly to the way that cities approach the complex sociotechnical transitions involved in reshaping urban infrastructure to respond to the challenge of climate change.

**Fry, M., 2013, Cement, carbon dioxide, and the 'necessity' narrative: A case study of Mexico, *Geoforum*, 49, 127-138**

Portland cement production accounts for similar to 5-7% of total global anthropogenic carbon dioxide emissions. Therefore, the cement industry is an important target for emissions-reduction strategies. However, according to industry projections, global cement demand will increase 43-72% by 2050, with growth concentrated in such economically-developing regions as India, Africa, Southeast Asia and Latin America. To the cement industry, the challenge is to simultaneously increase cement production while reducing carbon dioxide emissions. To date, industry efforts have included adoption of eco-efficient technologies, alternative and renewable fuel use, blended cements, and carbon sequestration. Yet little attention is given to the dynamics of cement consumption, especially in projected growth regions. In this paper, I use a case study of Mexico to (1) illustrate how cement is predominantly consumed, and (2) examine the role of the cement industry in promoting cement consumption. Recent scholarship on sustainability transitions provides a conceptual framework for understanding how carbon-intensive socio-technical regimes can transition to lower-carbon alternatives. Discursive regulation provides an analytical lens to understand how power dynamics underlying such regimes often forestall sustainable transitions and keep industries locked in to unsustainable practices. The Mexico case study shows that over 50% of cement is used in housing construction. As well, industry narratives linking cement to modernity, sustainability, and environmentalism serve to normalize cement and make it seem a necessity. The paper highlights how the cement industry uses power to discursively regulate cement consumption, which both fosters socio-technical regime path dependency and prevents the sustainable transition of the industry.