

This is the ninth 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
- Event reviews
- New research projects
- Publications

We welcome all members to submit news items for the next newsletter. You can use the website www.transitionsnetwork.org (submit projects, output or news), or send a message to 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,

The fourth International Sustainability Transitions conference in Zurich (19-21 June, 2013) was a great success, because of the excellent organization, coherent themes for sessions, and high quality of papers and presentations. I would like to thank the organizers for have done a great job, and wish the organizers of next year's conference (in Utrecht) good luck in emulating the success of the Zurich conference. Rene Kemp has written some further observations and reflections on the conference in this newsletter (see 'event reviews'). Nevertheless, I'd like to share some substantive views of my own. Firstly, it is clear that geography of transitions has become a popular new topic on the agenda. While this is an important development, I would like to invite scholars to go further than stating that 'space matters' and presenting another case study of a transition effort in a particular city. It may be interesting to go beyond single places and study interactions and flows (of people, ideas, resources, knowledge) between nodes in a network. It may also be relevant to investigate to what degree cities are constrained by their embeddedness in national sectors or systems, as Bolton and Foxon (2013) do in a recent paper (see under 'publications'). Secondly, various papers are providing deeper analyses of the roles of various specific actors (e.g. firms, civil society actors, cities, consumers) in transitions. While this 'deepening' is interesting and probably necessary, there is a risk that we lose sight of the importance of co-evolution and multi-actor processes in system innovation. A possible middle way might be to develop research designs that focus on certain actors, but still incorporate relations with other social groups. Thirdly, I think that there were too many papers on single 'green' technologies, e.g. battery-electric vehicles, wind turbines or solar-PV. While it remains important to trace the ups and downs of such individual innovation journeys, I feel that we pay insufficient attention

to the fact most sectors/systems are characterized by *multiple* green innovations, which can interact positively (e.g. stimulating 'green' discourses and policy pressure) and negatively (e.g. competing for scarce market resources, creating uncertainty about the 'best' innovation, which may hinder full commitment). I would personally like to see more papers that study this diversity of green innovations and how this hinders/stimulates transitions. Fourthly, I think that our community is perhaps overly optimistic about the potential of 'green' innovation to address environmental problems. While I am convinced that green innovation is important, I feel that we should also pay more attention to political economy, resistance and fight-back from incumbent actors. I was quite impressed (and depressed) by a recent book, called *The Burning Question. We can't burn half the world's oil, coal and gas. So how do we quit?* (Berners-Lee and Clark, 2013). The book shows that, in order to remain within the 450 ppm CO2 limit (which is associated with a 50% chance of staying within 2-degrees climate change), the world can still emit about 884 Gt CO2. The problem is that the world's *proven* fossil-fuel reserves are about 2800 Gt (with about 1870 Gt coal, 610 Gt oil, and 410 Gt gas) (*probable* reserves and *possible* reserves of fossil-fuels are far larger still). The firms and countries that have invested in finding these reserves (and own them) will do everything they can to sell these fossil fuels. This means that the low-carbon transition challenge is not just about stimulating 'green' alternatives, but also to about actively managing the decline of fossil-fuel based systems and preventing existing fossil-fuel reserves from being burned. Some scholars like Jeroen van den Bergh have previously argued that we need to pay more attention to environmental regulations, taxes, and maybe even bans. I do tend to agree with him, but would add that we may fruitfully study this in relation to green innovation (which probably remains the distinctive characteristic of our community) and in relation to political economy and power struggles (which scholars like Flor Avelino and Peter Newell have previously suggested). This debate would bring us in interaction with various 'mainstream' environmental scholars. I think that our community is more than ready for such interactions, given the high quality and impact of our work, as further evidenced in this newsletter.

This newsletter (see 'network news') reports on three (!) best-paper prizes which have been won in recent months for transition articles written by STRN-members. This is one indication of high quality and relevance. High quality is also demonstrated by the fact that the three winning proposals in the recent FP-7 call ('Transition to sustainable, low-carbon societies') were all developed by STRN-related consortia. This newsletter provides further description of the content of these proposals (see 'new research projects').

The newsletter also reports the articles in the most recent issue in the EIST-journal ('Environmental Innovation and Societal Transitions'), and a great number of recently published transition articles (see 'publications'), which showcase the ongoing vitality and diversity of the expanding transitions community. I hope you enjoy reading this newsletter.
Frank Geels, Chairman of STRN (frank.geels@mbs.ac.uk)

Environmental Innovation and Societal Transitions

The eighth volume of EIST has just been published at:

(<http://www.sciencedirect.com/science/journal/22104224/8>). Besides two book reviews, it contains the following articles:

Ulrich Elmer Hansen, Ivan Nygaard, 2013, Transnational linkages and sustainable transitions in emerging countries: Exploring the role of donor interventions in niche development, *Environmental Innovation and Societal Transitions*, 8, 1-19

Steffen Wirth, Jochen Markard, Bernhard Truffer, Harald Rohrer, 2013, Informal institutions matter: Professional culture and the development of biogas technology, *Environmental Innovation and Societal Transitions*, 8, 20-41

Bertha Maya Sopha, Christian A. Klöckner, Edgar G. Hertwich, 2013, Adoption and diffusion of heating systems in Norway: Coupling agent-based modeling with empirical research, *Environmental Innovation and Societal Transitions*, 8, 42-61

Marion Diaz, Ika Darnhofer, Catherine Darrot, Jean-Eudes Beuret, 2013, Green tides in Brittany: What can we learn about niche–regime interactions?, *Environmental Innovation and Societal Transitions*, 8, 62-75

John Wiseman, Taegen Edwards, Kate Luckins, 2013, Post carbon pathways: A meta-analysis of 18 large-scale post carbon economy transition strategies, *Environmental Innovation and Societal Transitions*, 8, 76-93

The next issue might be a special issue devoted the lifetime work of Prof. Robert Ayres, an intellectual founder of both Ecological Economics and Industrial Ecology. Various of his colleagues with ample experience on relevant topics write on the energy transition, making the link with climate and even crisis policies. Several important new ideas for transition investment and policy will be proposed in these contributions. Another special issue addressing lead markets and diffusion of environmental innovations is also close to ready. In addition, a special issue with the plenary lectures and finalists for the IST2013 Prize is being edited. A few other special issues are underway, as reported in previous newsletters.

I would like to repeat my earlier request to consider citing EIST articles in a relevant way in any of your forthcoming publications in ISI journals, as it seems that it is getting more difficult for new journals to become part of the ISI system. I further would like to urge readers to submit good quality papers to EIST, as well as short viewpoints (1000 words) with responses to earlier articles or issues. Sharp discussion is necessary for making progress on our understanding of sustainability transitions and their management.

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

Network News

Any news related to ongoing activities of STRN

Best paper award Bernard Truffer and Lars Coenen

Bernhard Truffer and Lars Coenen have been selected for the 2013 Regional Studies Association Best Paper Award for their article “Environmental innovation and sustainability transitions in regional studies” *Regional Studies*, 46 (2012), pp. 1-22. The paper reviews the literature in regional studies and economic geography over the past two decades, which has engaged with environmental innovations, clean tech industry dynamics and sustainability related concerns. The paper extends an invitation to economic geographers to visit socio-technical transition studies as a complementary competence field in these realms. The article also ranks in the top ten of the download statistics of the journal. We therefore expect quite a good resonance for transition studies in the future.

Best-paper award Frank Geels

Frank Geels has been announced Winner of the Best Paper Award from WWWforEurope (a European Commission project on ‘welfare, wealth and work’ <http://www.foreurope.eu/>) in an open competition on issues related to the Socio-Ecological Transition. The award was given for his 2013 paper ‘The impact of the financial-economic crisis on sustainability transitions: Financial investment, governance and public discourse’, *Environmental Innovation and Societal Transitions*, 6, 67-95. The jury highlighted the paper’s policy relevance, interdisciplinary approach and excellent argumentation.

Best-paper award Gill Seyfang, Sabine Hielscher, Tom Hargreaves, Mari Martiskainen and Adrian Smith

The paper ‘A grassroots sustainable energy niche? Reflections on community energy case studies’ by Gill Seyfang and colleagues received the Best Paper Award at the 2013 IST conference (International Sustainability Transitions) in Zurich. The award committee chose the paper for the following reasons. The focus on community based energy projects is original and relevant. The paper employs a rich empirical basis with multiple empirical sources, including case studies and interviews. Conceptually, the paper extends the niche-to-regime model by considering community-based grassroots initiatives. The paper is well

connected to existing literatures (e.g. strategic niche management, SNM) but also shows a healthy criticism of existing theory in the current setting. The paper effectively examines the general applicability of SNM in a non-technological/non-market-oriented context. The paper is well-written and the results are presented in a very systematic way.

Event announcements

Calls for upcoming relevant events such as workshops and conferences

Developmental Workshop on: Innovation for societal impact: A process perspective (26 September 2013, Leeds University Business School, UK)

We invite advanced Ph.D. students and junior faculty to present their research at a developmental workshop on innovation processes. Innovation has become increasingly important for the continued vitality of firms and regional, national and global economies. At the turn of the 19th century, innovation was driven by advances in manufacturing, and accelerated exponentially by its end because of the advent of information technologies. Now, we believe that innovation in the 21st century will be driven by responses to large societal challenges such as sustainability, population growth, climate change, energy, poverty and access to healthcare. We would particularly welcome projects on innovation that address such issues, although such a focus is not essential. We are also very interested in research projects that investigate cultural, institutional and organizational aspects of the changing nature of innovation processes. The innovation process itself has many components including invention (the emergence of an idea), development (the elaboration of the idea), and implementation (the widespread acceptance of the innovation) as they unfold across firms, networks, and communities. In addition, there are complexities associated with innovation processes including evolutionary complexity (e.g. path dependence involved), relational complexity (e.g. the entanglements between social and material elements that occur), temporal complexity (the asynchronies and diachronies that are involved), and cultural complexity (differences in the meanings associated with innovation across cultural systems). Proposals can cover any of these issues or related topics. For more information see the website <http://bit.ly/15JdNut> or contact one of the organizers Raghuram Garud, Joel Gehman, Krsto Pandza.

Joel Gehman <jgehman@ualberta.ca>

International conference on 'Energy Systems in Transition: Inter- and Transdisciplinary Contributions', Karlsruhe, Germany, 9-11 October 2013

The Helmholtz Alliance ENERGY-TRANS organizes an international conference which aims to improve the understanding of conditions, dynamics and impacts of energy transitions towards sustainability. Energy systems are understood as complex socio-technical systems that require transdisciplinary methods and a focus on policy and action oriented research. The conference programme entails parallel thematic sessions, a policy-meets-science event, and high-level keynote speeches from Eberhard Umbach, Frank Geels, Leena Srivastava, Thomas Dietz, and Lucia Reisch. Conference topics include:

1. Concepts, scenarios or modelling approaches, taking explicit account of the interface between technology, economic development and social changes;
2. Criteria/indicators for assessing the sustainability of energy transitions as well as tensions/conflicts between different dimensions of sustainability
3. Governance of energy innovations with a particular focus on path dependencies or path creation;
4. The role of subnational governance levels (including regional/local energy independence or even autarky) for enabling or facilitating energy transitions.
5. Energy consumption of households and industry;
6. Potentials and limits of public/stakeholder participation in planning procedures;

For more information see: www.energy-trans.de/conference-2013.

Event Reviews

Review of events interesting to the STRN community

Some observations and reflections on the 4th IST conference in Zurich

In June 2013, 190 transition researchers met at the 4th Sustainability Transition conference in Zurich at ETH to discuss research results and ideas with each other. In the opening presentation Arie Rip talked about the possible evolution of the system of science & technology institutions with its internally organized pressures for excellence and external demands for relevance. According to Arie Rip, the present system of scientific education and research organized around academic excellence might very well collapse because of the increasing demand for relevance in future funding. Juliet Schor spoke about the informal economy and the need for a “new economics” to deal with problems of inequality, inclusiveness and ecological crisis and Jim Murphy about bundled practices and the place-based nature of transition processes.

The conference brought together people from different walks of life and different age. An interesting coproduction was by Staffan Jacobsson and his son (a sociologist) about the language of functions and system goals used in the Technological Innovation Systems approach as troubling concepts for sociologists. In a reaction Marko Hekkert said that for him functions are great. They are “great” for helping researchers to go beyond individual events and for advising government. Another memorable contribution was the transition of the Copenhagen harbour which reflected a shift in attention from environmental quality to urban quality. The creation of a swimming area in what used to be a heavily polluted water area was predicated on ecological restoration and new thinking about the harbour as a place of recreation.

The above are just a few snapshots from a three day event involving a great diversity in presentations and arguments. For me the three days were highly enjoyable socially and intellectually. Instead of commenting on individual presentations, I would like to state three viewpoints. The first one is that as a community we should be more tolerant and open to different theoretical perspectives. Personally, I find the arena approach of Ulrich Jorgenson with its flat ontology from actor network theory a very valuable approach for considering the (micro) politics and avoid a reification of regimes and niches. For me the essential issue is not to be theoretically right but to be empirically rich with the analytical perspective being applied in service of that.

The second reflection is that I would welcome a more critical probing of other people’s research. In one of the sessions on social learning I probably probed too critically but on the whole I think criticism is needed for making further advances in understanding processes of transition change in their contrariety and for obtaining contextualized insights about how positive transition change can be brought about. For me the critical assessment of the experiences with transition management in Belgium by Erik Paredis constituted a healthy and welcome contribution.

The conference helped to identify avenues for future research. Important topics for further analysis are the geography of transitions processes, the politics in transition processes, micro-macro links and the role of social innovation in reshaping society. Each of the topics was well represented in Zurich in the form of specific streams and the choice of keynote speakers. What I missed at this conference and previous conferences were contributions from environmental scientists appraising transition paths environmentally taking into account that impacts are coproduced. I also like to see book projects in which findings are combined and integrated. A book project about “policies for sustainability transitions” would be a book I very much would like to read and contribute to.

Kemp R (MERIT) <r.kemp@maastrichtuniversity.nl>

WWF-workshop on 'From Planetary Boundaries to Global System Transitions for a Sustainable Planet', 5 September 2013, Stockholm

The World Wildlife Fund held an internal workshop at the Stockholm Resilience Centre to talk and rethink their sustainability strategy. One of the WWF organisers (Deon Nel) had written a thought piece in which he made the link between the debate about global planetary boundaries and the debate on system transitions. Several presentations from researchers from the Stockholm Resilience Centre (including Johan Rockström and Per Olsen) highlighted the scale and urgency of the problem and the need for big system changes. I gave a summary presentation of how transitions come about and what this means for policy options (and dilemmas). The combined discussions provided food for thought for the top-level WWF people, who are contemplating if WWF should adopt a more pro-active role, aimed at bringing about sustainability transitions. This would entail a move away from their traditional conservation orientation towards developing future visions, stimulating green innovations, and exerting pressure on incumbent players. WWF people were interested in the potential of the MLP to help identify leverage points that they could do to bring about transitions. They will write a document which will be discussed at their annual WWF-meeting, and then possibly form the basis of their new strategy. For the transitions community, this is an interesting self-fulfilling (and complexifying) dynamic, in which actors use our theories to model their strategic behaviour. It also highlights the relevance and impact of our work in the real world. **Frank Geels (frank.geels@mbs.ac.uk)**

International conference on 'Just Transitions', 1-3 July, Cape Town, South Africa

The 19th annual conference of the International Sustainable Development Research Society (ISDRS) focused on 'Just Transitions', which aimed to combine issues of environmental sustainability with considerations of justice and distribution. The fact that the ISDRS, which is the umbrella organization for research on sustainable development, dedicated a conference to transitions, and invited some STRN-members (Geels, Coenen, Vergragt) as speakers, highlights the increasing visibility of the topic. The conference was very well organized in a beautiful location (vineyard Spier), and there were interesting side-events, some of which confronted participants with the lived experience of poverty in shantytowns. It might have been useful if these side-events had occurred at the front rather than the end of the conference, so that issues of poverty and justice might have received greater attention during the conference. The conference was dominated by 'white faces' and the link between environmental transitions and poverty/justice was not addressed in great depth. A strength of ISDRS is that it is an umbrella organization, which led to a great diversity of presentations from various perspectives (engineering, economic, psychology, sociology) on many topics. But this diversity was sometimes also problematic in the sense that some sessions had little direction, lacked overarching themes, and found it difficult to establish fruitful discussion between presentations. Some of these problems were alleviated by a great sense of collegiality, good atmosphere, and great organization. The conference ended with a dance party after a spectacular performance of local singers and dancers. **Frank Geels (frank.geels@mbs.ac.uk)**

New research projects

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

TESS-project for FP-7 (Towards European Societal Sustainability)

The TESS-proposal is coordinated by Jürgen Kropp and Dominik Reusser, Climate Change and Development Group at the Potsdam Institute for Climate Impact Research. Partners are: The James Hutton Institute, Universitat Autònoma de Barcelona, Università degli Studi di Roma La Sapienza, T6 Ecosystems srl, Climate Futures, Oulu University of Applied Sciences, University Stefan Cel Mare Suceava. Transitions to low-carbon societies take place at multiple and complementary scales. Transition processes are highly dependent on

the innovative potential of community-based initiatives and their articulation with appropriate institutional architecture. Community-based initiatives are potentially more adaptable and less constrained by current structural circumstances than top-down policies and can give impetus to large-scale and technology driven changes. TESS will provide an understanding on the upscaling possibilities of such high-potential community-based initiatives by addressing two main questions: What is the impact of community-based initiatives in terms of carbon reduction potential and economic effect? What institutional structures (values, policies and mechanisms) support these initiatives in persisting beyond the initial phase and moving into an acceleration phase, spreading desired impacts? Answers will be provided through (1) a novel measuring, reporting and verification (MRV) framework for benchmarking community-based initiatives. This will enable quantifiable, comparable and standardised evaluation, and (2) the identification of success factors for the emergence, persistence and diffusion of promising initiatives, including online initiatives. We will identify these initiatives through case studies across regions and sectors and produce a systemic understanding of their impact on societal transitions towards sustainability. Our research will be integrated and transdisciplinary, with the unique opportunity to bring together social and natural scientists to foster a transition towards European societal sustainability.

For more information contact **Dominik Reusser** <reusser@pik-potsdam.de>

ARTS-project for FP-7 ('Accelerating and Rescaling Transitions to Sustainability')

The ARTS consortium is coordinated by DRIFT (NL). The ten other partners include: SPRU (UK), IOER- Leibniz Institute for Ecological Research (Germany), ICLEI (Germany), Austrian Institute of Technology (Austria), VITO (Belgium), Stockholm Resilience Centre (Sweden), Bogacizi University (Turkey), SZIE GAK - Szent Istvan University (Hungary) and RSM - Rotterdam Business School (Erasmus University Rotterdam, NL). The focal unit of analysis of ARTS project will be innovative activities and related actor-networks that are fundamentally changing energy, food, shelter and mobility provisioning patterns at the scale of a city or region, situated within a wider European context. ARTS will explore how lessons from these initiatives can be drawn for broader transitions to sustainable low-carbon European societies. Specifically the ARTS consortium aims to investigate and deepen our knowledge on the following research gaps that relate to the key conditions that can be associated to acceleration of transitions (also) in the context of cities and regions, namely: synergy, diversity, speed of change, inclusivity, knowledge dissemination and social learning. These we see as the key conditions for accelerating transitions. We will explore these conditions based on a diverse set of transition initiatives in five regions across Europe in an inter- and transdisciplinary way: Brighton, Budapest, Dresden, Flanders, and Stockholm. We seek to identify the values, conditions and mechanisms for accelerating sustainability transitions, develop strategies to assist and stimulate their acceleration and assess them with dynamic modelling approaches. For more information contact **Niki Frantzeskaki** (n.frantzeskaki@drift.eur.nl)

PATHWAYS-project for FP-7 ('Exploring transition pathways to sustainable, low carbon societies')

The PATHWAYS-project is coordinated by PBL Netherlands Environmental Assessment Agency. Seven other partners include: University of Manchester (UK), Fondazione Eni Enrico Mattei (Italy), Wuppertal Institute (Germany), Stockholm Environment Institute (Sweden), Kings College London (UK), Fraunhofer Institute (Germany), Lisbon University (Portugal). To investigate future transition pathways, the project aims to build bridges between three different approaches. 1) Integrated assessment studies, which provides a macro model-based perspective, 2) Socio-technical transition studies, which uses the MLP to investigate dynamics in various socio-technical systems, 3) participative action research which engages with concrete projects at the local and regional scale. The project will investigate and explore two kinds of transition pathways: 1) Technical component substitution, 2) Broader regime transformation. These pathways will be investigated for five empirical domains: a) Electricity, b) Heat and cooling, c) Mobility, d) Agri-food system, e)

Multifunctional land use and biodiversity. For each domain we will analyze the two pathways in terms of actors involved, drivers, barriers, sustainability potential, and policy options. Methodological integration between the three approaches is an important overarching goal. For more information contact **Frank Geels** (frank.geels@mbs.ac.uk)

IMPRESSIONS-project for FP-7 ('Impacts and risks from higher-end scenarios: Strategies for innovative solutions')

The IMPRESSIONS consortium is coordinated by Oxford University (UK). It includes DRIFT and Wageningen University (NL) and 21 other partners. IMPRESSIONS will provide empirically-grounded, transformative science that quantifies and explains the consequences of high-end climate scenarios for both decision-makers and society. IMPRESSIONS will develop and apply a novel participatory methodology that explicitly deals with uncertainties and strong non-linear changes. This new methodology will create a coherent set of high-end climate and socio-economic scenarios covering multiple scales. These scenarios will be applied to a range of impact, adaptation and vulnerability models and address possible tipping elements. Model results will inform the development of time- and path-dependent transition pathways, which will include mechanisms to foster synergies between adaptation and mitigation (adopting the Transition Management Approach). Methods will be applied within five linked multi-sectoral case studies at global, European and regional/local scales. Stakeholders within these case studies will be fully engaged in the entire research process. For more information about IMPRESSIONS contact **Paula Harrison** (PAHarriso@aol.com). For more information about transition pathways in the context of IMPRESSIONS research contact **Niki Frantzeskaki** (n.frantzeskaki@drift.eur.nl)

SUSTAIN Project with the Erasmus Mundus Action 3 ('Strengthening higher education in Urban Sustainability and Transitions towards internationalization of Academic Institutions and Networks')

The SUSTAIN consortium is coordinated by the Institute for Housing and Urban Development Studies with the Erasmus University Rotterdam (The Netherlands). DRIFT (NL) is included as well as 22 other partners. SUSTAIN aims to improve the quality of Tertiary Education in Sustainable Urban Development (SUD) in Europe and partner Universities in Asia, developing standardized educational modules related to SUD and furthermore enriching them with international perspectives and academic and vocational skills and competencies. SUSTAIN will create Modules on Sustainability Transitions and Transition Management on-demand to Higher Education programs in Indonesia, India and Asia. Cities associations will be involved in the project in order to bring best practices in HE through relevant case studies of SUD themes but also to integrate the labour market perspective. For more information about SUSTAIN contact **Stelios Grafakos** (s.grafakos@ihs.nl). For more information about transition management research and module in the context of SUSATIN contact **Niki Frantzeskaki** (n.frantzeskaki@drift.eur.nl) & **Flor Avelino** (avelino@drift.eur.nl)

Transition study of social innovation (TRANSIT)

This four-year study will apply transition thinking to the topic of social innovation. Led by DRIFT, the TRANSIT project will conduct an integrated analysis of social innovations (such as alternative energy cooperatives, science shops, time banks, design labs, eco-villages, transition towns and local resilience initiatives), looking at how these phenomena are operating through transnational networks across Europe and Latin America. The purpose of TRANSIT is to develop a theory of *transformative* social innovation, by studying how networks of social entrepreneurs and families of social innovation projects contribute to systemic societal change. Information about the project can be obtained from Flor Avelino from DRIFT and René Kemp from ICIS. avelino@drift.eur.nl and r.kemp@maastrichtuniversity.nl

Smart governance at the regional-European nexus: monitoring and evaluating European Knowledge and Innovation Communities (KICs)

The Dutch science foundation NWO have awarded Rob Raven, Koen Frenken en Sjoerd Romme from TU Eindhoven seed funding to develop a full proposal on monitoring and evaluating regional transitions from a sustainability transitions perspective. This funding will be used over the next month to elaborate partnerships with non-academic organisations. The team is interested to learn from already existing approaches to monitoring and evaluating sustainability transitions, in particular from a regional perspective. For more information contact **Rob Raven** (r.p.j.m.raven@tue.nl).

Call for book proposals on *Sustainable Development and Sustainability Transition*

Springer in cooperation with AFES-PRESS offers with its new Subseries on *Sustainable Development and Sustainability Transition* (SDST) a new peer reviewed book series that may be of relevance for scholars associated with STRN. The new series aims to offer scientists from different institutions and disciplines a platform for analysis and debate on sustainable development and transitions. It also aims to broaden the global and disciplinary perspectives of sustainability transitions research in Europe to create additional interest in the work of the Sustainability Transitions Research Network (STRN) in other regions outside of Europe, especially in Asia, Africa, North and Latin America. We welcome book proposals from scholars primarily from the social sciences who are working on conceptual, empirical and theoretical approaches to sustainable development and on sustainability transition. This subseries will include original monographs, edited books (e.g. workshop or research reports), and outstanding academic qualification studies (PhD and MA/MSc theses). A key goal of the subseries is to give scholars from the global South more voice and visibility in the peer-reviewed literature. All books in this subseries must be original and usually between 30,000 and 70,000 words. They are peer-reviewed and published as printed books in softcover and as Ebooks. More information, the book proposal form and the style sheet may be downloaded from the AFES-PRESS website on the ESDP book series at: <http://afes-press-books.de/html/SpringerBriefs_ESDP.htm> and on Springer's website at: <<http://www.springer.com/series/10357>>. You can also contact Hans Günter Brauch [hg.brauch@onlinehome.de]

Publications

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

PhD thesis: Erik Paredis, 2013, *A winding road. Transition management, policy change and the search for sustainable development*, Ghent University.

Transition management is an attempt at developing a theoretical and operational long-term governance approach for sustainable development. Although quite some authors have reflected and commented upon transition management, detailed empirical studies of TM-processes, particularly of their influence on regular policy, are not thick on the ground. Yet, if a transition is to succeed, new governance approaches will have to gain influence and change the discourse, the institutions and associated actor and power configurations that shape regular policy. This PhD dissertation explores the influence of transition management on the existing policy regime and uses an analytical framework that aims for an integral view on change. The main research question is: how do transition management processes influence existing policy regimes and policy practices? Which characteristics does this influence have, how can it be explained and what does it imply for the further development of transition governance? This general question is answered by studying in depth two Flemish transition management processes and their relation with existing policy: the first process is in sustainable housing and building, the second in sustainable materials management. One of the main lessons from the cases is that the changes that are visible in both policy regimes, cannot simply be explained by reference to the characteristics of the transition management

processes. Although these play a role, in as far as policy change is taking place, it is much more influenced by other factors: the state of the historically grown regime at the moment of intervention, the presence and role of powerful government agencies and societal actors, the influence of structural transformation processes at landscape level, the smart coupling work of policy entrepreneurs, the translation of discourses in a language that speaks to the regime. The interplay of these kinds of factors with the TM processes produces different routes of policy renewal, but can also constrain the renewal that is feasible. The research concludes that it is necessary to move away from TM as a stand-alone approach and embed it as part of a broader governance strategy where additional theories of social and political change are employed.

Phd thesis: Ulrich Elmer Hansen 2013: "The development of biomass power plant technologies in Malaysia: niche development and the formation of innovative capabilities".

On 27 August 2013, Ulrich Elmer Hansen, successfully defended his PhD thesis at the UNEP Risø Centre, Dept. of Management Engineering, Technical University of Denmark. Ulrich's thesis explored the overall topic of transfer and diffusion of biomass power plant technologies in Malaysia. As part of the analysis, Ulrich investigated the development of a palm oil biomass waste-to-energy niche in Malaysia by using a socio-technical transition framework, especially the strategic niche management perspective, in order to analyse the critical factors for niche development. His thesis also examined the development of innovative technological capabilities in the Malaysian biomass boiler and power equipment industry focusing particularly on the role of different sources of learning in capability formation. For further information contact Ulrich at: uleh@dtu.dk.

Steinhilber, S., Wells, P., and Thankappan, S., 2013, Socio-technical inertia: Understanding the barriers to electric vehicles, *Energy Policy*, 60, 531-539

It is widely accepted that electrification of the transport sector is one of several technological trajectories that could redress some of the environmental issues associated with the growth in travel demand including climate change and oil demand at a global scale, and air quality and noise pollution at the urban scale. Electric vehicles have been considered a promising technology at repeated intervals over the last century, but this promise has not been realised. This paper is a contribution to understanding the key tools and strategies that might enable the successful introduction of new technologies and innovations by exploring the key barriers to electric vehicles encountered in two countries (UK and Germany) where the automobile industry has been historically significant. The study evaluates stakeholders' opinions on relevant regulation, infrastructure investment, R&D incentives, and consumer incentives. The key findings of the research are that the introduction and penetration of EVs is confronted by several barriers that inhibit a larger market penetration under current conditions, which in turn casts doubt on the assumptions of strategic niche management and transitions theory.

Liu, D. and Shiroyama, H., 2013, Development of photovoltaic power generation in China: A transition perspective, *Renewable & Sustainable Energy Reviews*, 25, 782–792

Solar energy represents the largest source of renewable energy and is thus expected to play a crucial role in meeting our future energy demand. In China, solar energy utilization has made remarkable progress in recent years. In this paper, we reviewed the recent developments in the field of solar photovoltaic (PV) power generation from the perspective of transition theory, which was originally developed by technological innovation studies. The transition studies propounded three heuristic levels in a system, namely, socio-technical landscape, regime, and niche, and a transition of a system can only be fulfilled through the interactions among these three levels. With respect to the development of solar PV power generation in China, in this paper we initially examined specific situations within these three levels in the context of energy transition. In the subsequent sections, we paid attention to the

response of government in promoting the solar PV development amid energy transition. Specifically, relevant policies and some niche level special programs were investigated. Then, we examined the phased achievements in the transition and offered solutions to some newly emerged problems. The final section concludes with some comments.

Choi, H. and Anadón, L.D., 2013, The role of the complementary sector and its relationship with network formation and government policies in emerging sectors: The case of solar photovoltaics between 2001 and 2009⁶, *Technological Forecasting & Social Change*, forthcoming

Understanding the role of government policies in promoting the introduction of renewable technologies can help to catalyze the transition toward a more sustainable energy system. The literature on technological transitions using a multi-level perspective suggests that the co-evolution of the niche market (the new technology) and the complementary regime may have an important role to play in shaping this transition. This paper provides a quantitative analysis of the interactions between different types of solar photovoltaic (PV) networks at the niche level, the complementary semiconductor sector at the complementary regime level, and the solar PV policies in 14 different countries. Using three equations for solar PV knowledge generation, manufacturing, and deployment, we investigate linkages between feed-in-tariff (FIT) and renewable portfolio standard (RPS) policies, network development, and the existence of a complementary sector. The empirical findings show that the complementary sector is an important determinant in solar PV deployment and manufacturing and network effects are dependent on the strength of the complementary sector in solar PV deployment and manufacturing. Feed-in-tariff and renewable portfolio standards are associated with solar PV diffusion and not with manufacturing. Finally, domestic government policies promoting renewable energy markets, which often lead to domestic electricity rate increases, have contributed to increased manufacturing capabilities internationally, including also in countries without a strong complementary sector, such as China, through the channel of manufacturing collaborations from countries with a strong complementary sector.

Hoffman, J., 2013, Theorizing power in transition studies: the role of creativity and novel practices in structural change, *Policy Sciences*, 46(3), 257-275

An important theoretical challenge for theorizing about power dynamics in societal transitions is the transformation of power itself. In this respect, it is especially puzzling how agency at the level of novel practices can extend beyond the habitual, how it can draw on structures and destructure at the same time and in doing so, how it might emerge both as a creative and a destructive force. This article addresses this puzzle by scrutinizing and refining multi-level conceptions of power in the field of transitions studies. In the first part, it explores one specific multi-level framework by Grin and Van Tatenhove in a longitudinal case study of wind energy projects in Denmark and establishes that it has four conceptual shortcomings—relating to (1) temporality; (2) relationality; (3) materiality; and (4) creativity—that this article claims to overcome in the second part. In order to do so, it draws on several practice theories for an extended framework that enables the unpacking of the interplay between creativity and transition processes.

Eames, M., Dixon, T., May, T. and Hunt, M., 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.

Ceschin, F., 2013, Critical factors for implementing and diffusing sustainable product-Service systems: insights from innovation studies and companies' experiences, *Journal of Cleaner Production*, 45, 74-88

Eco-efficient Product-Service System (PSS) innovations represent a promising approach to sustainability. However the adoption of such business strategies is still very limited because it often involves significant corporate, cultural and regulatory barriers. An important challenge is not only to conceive eco-efficient PSS concepts, but also to understand the contextual conditions that facilitate their societal embedding, and which strategies and development pathways are the most appropriate. The combination of theoretical insights from innovation studies (in particular Strategic Niche Management and Transition Management) and a case studies research (exploring the innovation journeys made by six companies in introducing their eco-efficient PSS innovations in the market) is used to investigate the factors that influence the implementation and diffusion of this kind of innovations. The article provides a structured overview of these factors, grouping them in four clusters: implementation of socio-technical experiments; establishment of a broad network of actors; building up of a shared project vision; creation of room for broad and reflexive learning processes. Based on these results it is argued that a broader and more strategic system approach should be adopted by companies. Companies should focus not only on the PSS solution and its value chain, but also on the contextual conditions that may favour or hinder the societal embedding of the PSS itself. The article concludes by outlining a key area for future research.

Park, S., 2013, The country-dependent shaping of 'hydrogen niche' formation: A comparative case study of the UK and South Korea from the innovation system perspective, *International Journal of Hydrogen Energy*, 38(16), 6557 – 6568

This paper reports an international comparison of hydrogen niche formation in the UK and South Korea with special regard to policy development. Hydrogen energy development has provided us with a good example of ongoing phenomena during the early stage of socio-technical transition, in other words, the socio-technical niche. The purpose of the case studies was to see the country dependence in shaping the early stage (the period between the year 2002 and 2005) of hydrogen niche formation from the national innovation system perspective. The findings show certain differences in the background of hydrogen energy policies and the manners of policy development. There also are differences in the R&D activities, including not only the way in which they are performed, but also the strategic focussing of R&D, which have been influenced by R&D systems and the industrial structures of the national innovation systems. Vision-articulating processes and the roles and tendency towards intervention of governments are diverse. The research result will contribute to better understanding of the geography of socio-technical transition with empirical evidence. From that, one will be hinted that the hydrogen future may be diverse in different locations.

Smink, M.M., Hekkert, M.P. and Negro, S.O., 2013, 'Keeping sustainable innovation on a leash? Exploring incumbents' institutional strategies', *Business Strategy and the Environment*, forthcoming

This research aims to identify the institutional strategies of incumbent firms with regard to sustainable energy innovations that threaten their interests. This exploratory study contributes to the multi-level perspective by providing new insights into niche–regime interaction. The focus on actor behavior in transitions is informed by literature from

institutional theory and strategic management. Based on semi-structured interviews with actors and on documents related to LED lighting and biofuels in the Netherlands, this study identified a preliminary set of empirical strategies: providing information and arguments to policy makers and the general public, as well as strategically setting technical standards. Incumbents are in a position to significantly influence the innovation's development by employing these strategies; thus temporarily keeping sustainable innovation on a leash.

Binz, C., Truffer, B. , Coenen, L., 2013, Why space matters in technological innovation systems: Mapping global knowledge dynamics of membrane bioreactor technology, *Research Policy*, forthcoming

Studies on technological innovation systems (TIS) often set spatial boundaries at the national level and treat supranational levels as a geographically undifferentiated and freely accessible global technological opportunity set. This article criticizes this conceptualization and proposes instead to analyze relevant actors, networks and processes in TIS from a relational perspective on space. It develops an analytical framework which allows investigating innovation processes (or 'functions') of a TIS at and across different spatial scales. Based on social network analysis of a co-publication dataset from membrane bioreactor technology, we illustrate how the spatial characteristics of collaborations in knowledge creation vary greatly over relatively short periods of time. This finding suggests that TIS studies should be more reflexive on system boundary setting both regarding the identification and analysis of core processes as well as in the formulation of policy advice.

Nevens, F., Frantzeskaki, N., Gorissen, L. and Loorbach, D., 2013, Urban Transition Labs: co-creating transformative action for sustainable cities, *Journal of Cleaner Production*, 50, 111-122

In a general mindset of 'local elaboration' of sustainable development, cities are logical loci for action: they do not only concentrate (future) consumption and production and are hence at the origin of unsustainability 'symptoms', they simultaneously are the operational units in which concrete actions can be envisaged, designed, (politically) facilitated and effectively rolled out. Whenever cities engage in this innovative, ambitious and responsible task of change for integrated sustainability, an undoubtedly major amount of learning emerges; and vice versa, sound knowledge/best practices on how to proceed with local sustainability oriented change processes could be a firm support for local actors in their quest for effective and efficient action. In this paper, we present 'Urban Transition Labs' (UTL) as settings in which real life trajectories of sustainable development in cities are deployed and at the same time carefully observed; in a co-creative collaboration between actors and researchers (transdisciplinary research). Thereby, a transition management approach is applied, resulting in a cycle of five distinct phases: (a) process design and system analysis, (b) problem structuring and envisioning, (c) back casting, determining major pathways and agenda setting, (d) experimenting and (e) monitoring and evaluation. The process is guided by a 'Transition-team' that co-designs the process and feeds in relevant information to the city transition 'arenas'. These arenas are the actual initial incubators of change; they are crewed by local frontrunners that are considered as engaged visionary people with diverse backgrounds. The findings of arenas feed a further participatory process to engage the relevant city stakeholders into action. In this paper, we want to present the UTL as a potentially valuable concept to support a 'walking-the-talk' of sustainable development by cities; and we share the first impressions on specific barriers and enablers that could determine the effectiveness of the envisaged approach.

Delina, L. and M. Diesendorf. 2013. Is wartime mobilisation a suitable policy model for rapid national climate mitigation? *Energy Policy* 58: 371-380

Climate science suggests that, to have a high probability of limiting global warming to an average temperature increase of 2 °C, global greenhouse gas emissions must peak by 2020 and be reduced to close to zero by 2040. However, the current trend is heading towards at least 4 °C by 2100 and little effective action is being taken. This paper commences the

process of developing contingency plans for a scenario in which a sudden major global climate impact galvanises governments to implement emergency climate mitigation targets and programs. Climate activists assert that rapid mitigation is feasible, invoking the scale and scope of wartime mobilisation strategies. This paper draws upon historical accounts of social, technological and economic restructurings in several countries during World War 2 in order to investigate potential applications of wartime experience to radical, rigorous and rapid climate mitigation strategies. We focus on the energy sector, the biggest single contributor to global climate change, in developed and rapidly developing countries. We find that, while wartime experience suggests some potential strategies for rapid climate mitigation in the areas of finance and labour, it also has severe limitations, resulting from its lack of democratic processes.

McDowall, W., P. Ekins, et al. (2013). "The development of wind power in China, Europe and the USA: how have policies and innovation system activities co-evolved?" *Technology Analysis & Strategic Management*, 25(2): 163-185.

This paper takes an innovation system approach to analysing the development of wind energy in three jurisdictions: the EU, USA and China. The paper builds on and extends previous innovation system studies on wind in two ways. First, it focuses on the interactions over time between policy and innovation system dynamics, in order to highlight lessons for low-carbon policymaking. Second, it extends the analysis from the formative and growth phases of the innovation system to the globalisation and transfer phase, in which mature technologies are transferred to new markets. The conclusions are: first, policies should go beyond 'market pull' and 'technology push' and should take into account the institutional frameworks through which they are delivered; second, policies have been more successful where they prioritised long-term learning-oriented deployment rather than short-term efficiency; third, system failures exist at the transfer stage of development as well as during formative and growth phases.

Bos, J.J., Brown, R.R., Farrelly, M.A. 2013 A design framework for creating social learning situations. *Global Environmental Change* (23) 398-412

Learning nurtured through experimentation is very important for enabling sustainability transitions. Over the last decade, different strands of research have investigated social learning and its associated processes to better understand learning efforts aimed at socio-technical system change. While some necessary process considerations to enable social learning have been established, actual design and organisation of experiments that aim to create a social learning situation remain largely unexplored. Against this background, this paper presents an empirical, mixed-method study that investigated a governance experiment within the Australian urban water sector. This experiment enabled widespread learning, resulting in socio-technical system change. The research reveals that social learning in particular is more complex in reality than in theory and that not all system stakeholders need to learn the same to achieve system change. Further, this paper develops a framework that outlines enabling starting conditions and features for designing and organising social learning situations. The framework comprises focus projects, multi-organisational peer groups, distributed facilitation, adaptability and flexibility, time and science/research. The key findings provide practical strategies for designing and operationalising policy and governance reform agendas that embrace learning situations.

Ferguson, B.C., Frantzeskaki, N. and Brown, R.R. (2013). A strategic program for transitioning to a Water Sensitive City. *Landscape and Urban Planning*, 117, 32-45.

In the context of climate change, resource limitations and other drivers, there is growing international acceptance that conventional technocratic approaches to planning urban water systems are inadequate to deliver the services society requires. Instead, scholars and practitioners are calling for a shift to an adaptive approach that increases a system's sustainability and resilience. This shift is significant, requiring transitions in the way urban

water systems are planned, designed and managed. However, there is limited understanding of how strategic initiatives can be deliberately managed and coordinated to reform mainstream policy and practice. This paper aims to develop a strategic program for this purpose. It draws on strategy literature to develop a scope and logic for a general program that can address challenges for long-term urban infrastructure management related to path-dependencies, the direction of transformative change, system complexity and future uncertainty. The content of a normative transition scenario, developed in participatory workshops by water practitioners in Melbourne, is then presented, focusing on the transition to a “water sensitive city”. The scenario comprises a problem definition, vision and strategies, which provide lessons for contextualizing the strategic program for the specific purpose of enabling transformative change in urban water systems. These lessons are synthesized in strategy goals and planning processes that form the design base of a strategic program. With tailoring for local contexts, the strategic program can provide operational guidance for planners, designers and decision-makers in strategically planning and managing initiatives to facilitate sustainability transitions in urban water systems.

Bolton R. and Foxon, T.J., 2013, "Urban infrastructure dynamics: Market regulation and the shaping of district energy in UK cities" *Environment and Planning A*, forthcoming

This paper explores the interaction between urban-scale energy infrastructure and the regulatory regime which underpins the liberalisation of energy systems. Using the example of district energy in a number of UK cities, we outline the ways in which the structure of national electricity markets and the activities of the energy regulator influence and shape the development of low-carbon infrastructure in cities. We draw upon recent contributions to the sociotechnical systems literature which highlights the role of cities in shaping infrastructure transitions and argue that the influence of sector regulation has been underrepresented and underexplored. Our study points to significant tensions and misalignments between a regulatory regime designed to promote economic efficiencies in incumbent national infrastructure sectors and the development of district energy systems at the urban scale. We propose that regulation needs to evolve from its traditional emphasis on promoting competition and short-term efficiencies towards a more dynamic model which is open to alternative logics and low-carbon transition pathways.

Crivits, M. and Paredis, E., 2013, Designing an explanatory practice framework: Local food systems as a case, *Journal of Consumer Culture*, forthcoming

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-à-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.

Schmidt T.S., Dabur, S. (2013): Explaining the diffusion of biogas in India: a new functional approach considering national borders and technology transfer, *Environmental Economics and Policy Studies*, forthcoming

Renewable energy technologies have been identified as one important lever for mitigating environmental problems such as climate change. However, several obstacles stand in the way of their ample diffusion in both industrialized as well as developing countries. Besides the pure analyses of barriers to the diffusion of these technologies, the functions of innovation systems approach promises insights on how to augment their diffusion via policy measures. We extend these approaches by introducing a spatial dimension into the functions literature. Thereby, we allow transfer of technology, know-how and financial resources to be an integral part of the innovation system literature. By applying our new framework to the case of biogas in India, we do not only demonstrate its suitability and added value for researchers, but also derive policy recommendations for both, national and international policy makers on how to remove existing barriers by strengthening the functions of the innovation system.

Jacobsson, S and K. Karltorp (2013) Mechanisms blocking the dynamics of the European offshore wind energy innovation system - challenges for policy intervention, *Energy Policy*, forthcoming

Decarbonizing electricity production in the EU may necessitate building new “low-carbon” capacity (excluding nuclear investments) to deliver 3500 TWh by 2050. Offshore wind power has the potential to contribute substantially to fill this gap. Realizing this potential is, however, difficult since deployment offshore does not constitute a simple diversification by the onshore wind turbine industry to a new segment. This paper identifies factors obstructing the development of the northern European innovation system centred on offshore wind power, specifies a set of associated policy challenges and discusses various policy responses.

Switzer, A., Bertolini, L. & Grin, J., 2013, Transitions of mobility systems in urban regions: A heuristic framework, *Journal of Environmental Policy and Planning*, 15(2), 141-160

This article examines the possible contributions that transition studies can make to better understand the problems that hinder attempts to deliver co-ordination between transport and land-use planning and better integration between modes of transport in urban regions. Recent publications focus on barriers of co-ordination between transport and land use and methods to overcome them. Obdurate social and material structures are the dominant obstacles for change. For this reason, transition studies are considered to conceptualize the mobility system. In the article, key theories in transition studies are first considered. Following this, the ways in which these concepts can be used to characterize the system of transport and land-use planning are explored; it is demonstrated that the system and the challenges facing it can be better understood by using these concepts. This has resulted in a conceptual model for the development of the mobility system. A focus-group session in the Noordvleugel region of the Randstad in the Netherlands has been used to test the usability of this model in practice, gauge the participants' reactions to it and to supplement it, if necessary. By combining insights about how to conceptualise change in socio-technical systems and more specific knowledge about transport land-use planning, this article gives

new insight into how a transition towards better co-ordination between transport and land-use planning and the transport network could occur, as well as how it could be hindered. It also provides interesting indications of research options examining cases where such transitions have taken place or been attempted.

Murphy, J. and Smith, A. (2013) Understanding transition–periphery dynamics: renewable energy in the Highlands and Islands of Scotland, *Environment and Planning A*, 45, 691 – 709

Over the coming decades the Highlands and Islands of Scotland will be transformed as new technologies and infrastructures are installed to exploit wind, wave, and tide power. However, interactions between the region—understood as a sociospatial category shaped by history, culture, and institutions—and these technologies are poorly understood and need to be appreciated in more detail before the changes gather momentum. In this paper we link and extend research around sociotechnical transitions and resource peripheries and use this framework to analyse wind energy projects on the island of Lewis. Our analysis draws attention to transition–periphery dynamics and the ways in which renewable energy projects and particular locations are co-shaping each other through these. Building on this case study we suggest implications for the region as a whole, argue that the analytical–normative agenda of sociotechnical transitions should be recast, and highlight the need for more research on sociotechnical transitions and new resource peripheries.

Hargreaves, T., S. Hielscher, G. Seyfang and A. Smith (2013), Grassroots innovations in community energy: the role of inter-mediaries in niche development, *Global Environmental Change*, forthcoming

Community energy projects are attracting increasing attention as potential sources of innovation to support sustainable energy transitions. Research into ‘grassroots innovations’ like community energy often recognises the difficulties they face in simply surviving let alone in growing or seeding wider change. Strategic niche management theory is potentially helpful here as it highlights the important roles played by ‘intermediary actors’ in consolidating, growing and diffusing novel innovations. This paper presents the first in-depth analysis of intermediary work in the UK community energy sector. New empirical evidence was gathered through interviews with 15 community energy intermediaries and a content analysis of 113 intermediary-produced case studies about community energy projects. Analysis finds intermediaries adopting a variety of methods to try and diffuse generic lessons about context-specific projects, but that trying to coordinate support for local projects that exist amidst very different social and political circumstances is challenging. This is exacerbated by the challenges of building a coherent institutional infrastructure for a sector where aims and approaches diverge, and where underlying resources are uncertain and inconsistent. Applications of relatively simple, growth-oriented approaches like strategic niche management to grassroots innovations need to be reformulated to better recognise their diverse and conflicted realities on the ground.

Vinnari, M. and Vinnari, E., 2013, A Framework for Sustainability Transition: The Case of Plant-based Diets, *Journal of Agricultural & Environmental Ethics*, in press, forthcoming

Societal and technological development during the last century has enabled Western economies to achieve a high standard of living. Yet this profusion of wealth has led to several outcomes that are undesirable and/or unsustainable. There is thus an imperative need for a fundamental and rapid transition towards more sustainable practices. While broad conceptual frameworks for managing sustainability transitions have been suggested in prior literature, these need to be further developed to suit contexts in which the overall vision is arguably clear, such as in the case of consuming animal-originated foodstuffs. In this article we introduce a novel transition management framework that is based upon the dimensions of sustainability. The suggested transition process includes the identification of objectives

and obstacles, the listing of options and their opportunities and threats as well as the evaluation of the outcomes (the Five O's). We argue that sustainability transition management should be a process in which the identification of the relevant dimensions of sustainability and related objectives forms the foundation for strategic, tactical and operational governance activities. We illustrate the practical applicability of the framework in the case of transition towards plant-based diets.

Safarzynska, K., and J.C.J.M. van den Bergh (2013). An evolutionary model of energy transitions with interactive innovation-selection dynamics. *Journal of Evolutionary Economics* 23: 271-293.

We develop a stylized application of a new evolutionary model to study an energy transition in electricity production. The framework describes a population of boundedly rational electricity producers who decide each period on the allocation of profits among different energy technologies. They tend to invest in below-average cost energy technologies, while also devoting a small fraction of profits to alternative technological options and research on recombinant innovation. Energy technologies are characterized by costs falling with cumulative investments. Without the latter, new technologies have no chance to become cost competitive. We study the conditions under which a new energy technology emerges and technologies coexist. In addition, we determine which investment heuristics are optimal in the sense of minimizing the total cost of electricity production. This is motivated by the idea that, while diversity contributes to system adaptability (innovation) and resilience to unforeseen contingencies (keeping options open), a high cost will discourage investments in it.

Verhees, B., R. Raven, F. Veraart, A. Smith, F. Kern (2013) The development of solar PV in the Netherlands: a case of survival in unfriendly contexts, *Renewable and Sustainable Energy Reviews*, 19, 275-289

This paper reviews the developments of solar photovoltaic (PV) technology in The Netherlands. Despite the recent boom in PV industries and its global deployment, The Netherlands has up to now not experienced major growth in the diffusion of PV electricity generation. But this is only part of the story. This paper focuses on the question why PV is still around in The Netherlands at all despite its, at times, harsh policy and socio-economic contexts. It builds upon a recently developed framework from the field of transition studies that distinguishes between shielding, nurturing and empowerment of sustainable innovations. A descriptive historical review is combined with an analysis of niche space that shows how PV advocates have been able to strategically secure and shape protective measures over four decades in the context of harsh regime selection environments. The paper suggests how further analyses using this shielding-nurturing-empowerment framework can benefit from this exploratory study into PV innovation in The Netherlands.

Maj-Britt Quitzau, Jens Jensen, Morten Elle, Birgitte Hoffmann, 2013, Sustainable urban regime adjustments, *Journal of Cleaner Production*, 50, 140-147

The endogenous agency that urban governments increasingly portray by making conscious and planned efforts to adjust the regimes they operate within is currently not well captured in transition studies. There is a need to acknowledge the ambiguity of regime enactment at the urban scale. This directs attention to the transformative implications of conscious strategic maneuvering by incumbent regime actors, when confronting regime structurations. This article provides insight to processes of regime enactment performed by local governments by applying a flow-oriented perspective on regime dynamics, inspired by Actor-Network Theory to demonstrate that regime incumbent actors *can* induce gradual regime adjustments at the urban scale. This is done through a case study of an urban development project, where the Municipality of Egedal in Denmark has successfully promoted energy efficient buildings through adjustments in existing planning and building procedures.