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Sustainable Consumption Institute

Sustainable Consumption Institute

SCI Newsletter Summer 2016

SCI News, Research and Events

Dale Southerton (SCI Director), **Andrew McMeekin** (SCI Research Director)

It is always nice to start this newsletter by welcoming new arrivals to the SCI. Julie Kasmire and Wouter Spekkink have both joined as Research Associates working with Frank Boons on projects exploring innovative methodologies. We also look forward to welcoming three new PhD researchers in September and Tally Katz Gerro who is joining us from the University of Haifa (Israel) as a Reader in Sociology in September. However, we cannot always only announce arrivals and it is with great sadness that David Evans will be moving on to take up a Professorship in Geography at Sheffield University. David has been instrumental in the work of the SCI over the past six years, and fortunately for us will continue to be involved as a SCI Honorary Fellow.

With 7 journal articles and 6 book chapters published since January the SCI continues to contribute cutting edge insights to the sustainable consumption research community. Amongst these are an article in Nature Climate Change (volume 6, issue 6) by Frank Geels and colleagues that explores approaches for low-carbon transitions. Frank also discussed some of the ideas from this article in his keynote address ('Global climate governance and socio-technical transformation: Is the Paris agreement enough?') at the 2016 Berlin Conference on 'Global Transformative Climate Governance après Paris', in May. In total, SCI members have delivered 6 such keynote addresses since January and presented conference papers in 11 different countries, three of which are outside of the EU.

Our research is also becoming increasingly recognized and rewarded. In the last few months Joe Blakey was awarded the Royal Geographical Society (with IBG) Planning and Environment Research Group (PERG) award (see page 7), and Harald Wieser received the best abstract award at the AMBS Annual PhD conference (see page 8). Sherilyn MacGregor has been appointed to University of Manchester's Environment Sustainability Academic Engagement Committee, while Jennifer Whillans was awarded a prestigious four year British Academy Fellowship to explore how working households coordinate their day-to-day lives, with a particular focus on their food consumption. Finally, Frank Geels and myself have been selected to participate in a scoping meeting for an Intergovernmental Panel on Climate Change (IPPC) Special Report. The meeting, which will take place in Switzerland in August, will address the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways. 78 delegates were selected from across the world, 5 of which are from the UK and 2 from the SCI!

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Visit to the SCI by colleagues and collaborators from the Chinese Academy of Social Sciences

As part of the SCI's developing cooperation with the Chinese Academy of Social Sciences (CASS) Beijing, we held a workshop on the 18th May with SCI, University of Manchester and CASS colleagues. That afternoon - as part of the monthly SCI seminars - we also hosted Dr Jennifer Smith Maguire (University of Leicester) who presented her work on the consumption of wine among the Chinese middle classes.

The workshop theme was "Division and transition: consumer culture in China in relation to market, environment and welfare". After a welcome by Professors Alan Warde and Dale Southerton, Dr Zhu Di (CASS) started off the workshop by presenting her work on life satisfaction of

the urban population and its impact on sustainable consumption. Professor Chen Guangjin (Director, CASS) talked about distinction in consumption and perspective of anti-poverty. Dr Zheng Shaoxiong (CASS) presented on the history of consumption and production systems in the management of public environmental resources in the Western China Mountains. From the University of Manchester Dr Alison Browne (SCI/Geography) presented work on the transition of water-energy consumption in China specifically histories and trajectories of cleanliness and hygiene, Dr Dan Welch (SCI/Sociology) presented on consumers, collective actors and the public sphere. Professor Yang-Wen Zheng (Centre for Chinese Studies, UoM) presented on historical patterns and cultures of consumption in China, and the way foreign products become indigenised.

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Could smart cities be smarter about inequality?

Our cities are unequal – in wealth, quality of life and our carbon footprints, amongst other factors. In the race to use technology to build so-called 'smart cities', Joe Blakey says we run the risk of locking-in, rather than tackling, those inequalities.

Definitions and data

When it comes to smart cities , Manchester is setting the example for the EU and beyond. But before this pioneering scheme progresses even further, now is the time for careful and considered design, with citizens and the principle of equality, front and centre. The term 'smart city' has been banded about quite a lot within the policy arena. With numerous, often vague, meanings, it's hard to pin down – even the Government hasn't clearly defined what they are and says "there is no absolute definition of a smart city".

But what these definitions do seem to have in common, is data and trying to intelligently use it to solve problems. With camera networks, tweets, traffic sensors, weather stations, building management systems and GPS locators, to name but a few, cities are certainly creating a lot of data. They're also facing a lot of challenges, including profitability, quality of life, sustainability and trying to be efficient.

So how can policymakers tighten up their definition of what a smart city should look like? Perhaps the EU-funded smart cities and communities project known as TRIANGULUM is a good example which is innovating and testing smart technologies, aiming to replicate successful solutions within their cities and beyond. Within this pioneering project three leading cities - Manchester (UK), Eindhoven (Netherlands) and Stavanger (Norway) - are developing smart solutions that will be rolled out to the three follower cities of Sabadell (Spain), Leipzig (Germany) and Prague (Czech Republic).

Curation and innovation

Manchester's innovation has already begun on Corridor Manchester – its chosen project site. The Corridor spans just short of 2.5 square kilometres, nestled either side of Oxford Road, encompassing The University of Manchester, Manchester Metropolitan University and The Central Manchester University Hospitals NHS Foundation Trust. It is a key transport route, with Oxford Road as one of the busiest bus routes in Europe. The site is highly knowledge intensive, home to not only the largest campus in the UK but also a leading science park. For these reasons and more, it serves as a key strategic economic growth site, already generating £3bn GVA per annum.

As part of their approach, Manchester City Council, The University of Manchester, Manchester Metropolitan University, Clicks and Links and Siemens are developing 'City-Sense', which is, in their own words, trying to 'curate' the Corridor's data. A digital inventory of the Corridor's data feeds intended to be used for various innovative applications and better decision making. But what could this mean for citizens?

Just imagine a cycle planner that determines a route not just for the shortest journey, but according to live data on current pollution or noise levels, or cycle-friendly roads, or heating that automatically switches on later if there is a traffic jam into the city centre. Imagine new bus services scheduled according to the routes searched for on travel planners or having access to data on whether certain roads have been gritted after snow or if your bus is delayed, so you don't have to wait in the cold. It makes the public feel more informed and councils and organisations become more transparent.

These are just a few examples of the possibilities that City-Sense could provide, and surely, with all of this information, councils and organisations could deliver better services for citizens?

Siemens once argued along similar lines, that "several decades from now cities will have countless autonomous, intelligently functioning IT systems that will have perfect knowledge of users' habits and energy consumption, and provide optimum service". But can we really have 'perfect' knowledge of cities in the form of data?

Data and power

The term 'data' first emerged in the seventeenth century, with Latin roots as the plural of datum, meaning 'something given in argument and taken for granted', in contrast to fact. Disproven facts cease to be called facts, but false data is still data. Data reflects the people who create it, serving a particular purpose. City-Sense is no different, charged with curating data, implying some form of sifting and maintenance. This is of course necessary, to assure that the data is reliable, that the data feeds won't mysteriously disappear and that they represent the city.

Crucially, and perhaps worryingly, the data curators will have the power to shape society for the better, or worse. One question raised during the development of City-Sense was whether data beyond the Corridor should be included. On the surface, this may appear odd, given that the Corridor is the site of the project. But if you consider the makeup of the Corridor, it's clearly a prosperous business area with few domestic properties. With the science park and the Universities, it is an obvious choice, both for data contributors and innovators. But what about the people that use the Corridor? How well does it engage the surrounding areas, such as Ardwick and Hulme? Where do its workers come from? The food that is consumed? The Corridor does not exist in a sealed bubble and its data should not either. Not attending to this would create inequalities in 'smartness', a divide between the Corridor and its neighbours.

A human-centric approach

It is easy to see, therefore, that how data is managed (and created) will paint a very different portrait of the area it supposedly shows. It is for this reason I would argue that 'perfect data' can never really exist in the way that Siemens may have, at least once, believed. Smart projects should never be seen to be a perfect cure to the problems and disagreements we have in our cities.

However, 'smart' cities and 'smart' projects need not appear sinister. I would appeal to policymakers involved in pioneering smart city projects that they should carefully consider how platforms will be designed to ensure they place people and equality at the forefront. I hope this human-centric approach is one of the aspects that Manchester will execute well with City-Sense, to be replicated in follower cities and beyond.

This post first appeared on The Manchester Policy Blogs

Joe Blakey is a PhD student in Human Geography at The University of Manchester and a member of the Sustainable Consumption Institute (SCI). His research is concerned with the politics of accounting, primarily through the lens of carbon footprinting.

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Professor Mark Harvey appointed Honorary Professor in Sociology at the Sustainable Consumption Institute

The Sustainable Consumption Institute is delighted to announce the appointment of Mark Harvery as Honorary Professor. Mark has had a long association with SCI colleagues, first as a Senior Research Fellow at the ESRC Centre for Research in Innovation and Competition (1997-2007), and then as a member of the ESRC Sustainable Practices Research Group (2011-2014).

His work develops a neo-Polanyian approach to configurations of production, distribution, exchange and consumption, with an historical and comparative perspective. Looking at processes of long duration transformation and societal variation, he has explored a range of diverse objects: tomatoes, genomes, biofuels, drinking water and most recently the soya bean. In these works, he explores themes of the shifting place both of economy in society and of society in nature.

As an ESRC Professorial Research Fellow, he is currently researching the dynamics of the food-energy-climate change trilemma, in the context of the finitudes of environmental resources – particularly of land, water and fossil energy. Different societies generate and face different climate change and resource challenges, analysed as sociogenic rather than anthropogenic sustainability crises. The research compares Brazil, China, India and Europe.

Mark's most recent trip to China involved interviewing experts on China's climate change sustainability crisis relating to agriculture, food, and in particular the transition to eating more meat. Overuse of chemical fertilizers and high levels of pollution from intensive pig farming are occurring at a time when China is shifting sharply away from food self-sufficiency, with increasing imports of animal feed and meat. Politically, this is taking place in the context of a major transition in land-holding with some promoting marketization of land which could result in the end of peasant small-holders. Mark also helped to consolidate research links between CRESI at Essex, the SCI and members of the Sustainable Consumption Research and Action Initiative. He was particularly intrigued by one of the interviewees quoting Karl Polanyi: 'Leaving the fate of soil and people to the market would be tantamount to annihilating them.' The tensions of China's trilemma are indeed intensifying.

Mark is currently Professor of Sociology and Director of the Centre for Research in Economic Sociology and Innovation (CRESI) at the Department of Sociology, University of Essex

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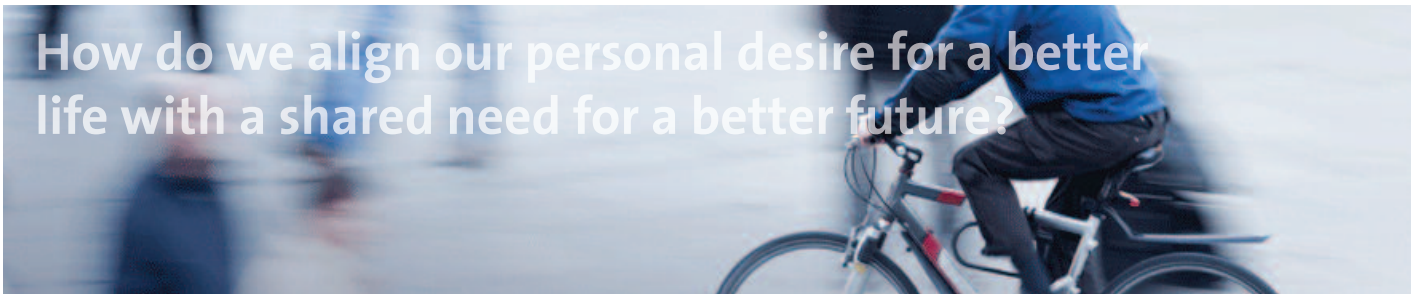

Understanding processes of reconfiguration: advancing new methodological approaches

Without exception, visions on sustainable economies call for a reconfiguration of production and consumption systems. Whether it is the circular economy, the performance economy, or the transition to a carbon neutral society, existing structures of provision are found to be in need of substantial change: there seems to be general agreement that a green economy cannot be achieved through incremental change of a few components only.

Research that seeks to understand such change requires the analysis of longitudinal processes at the level of production and consumption systems. Substantial work has been done in this respect, and we have increased our understanding of important historical transitions, as well as the pathways through which contemporary technological regimes are sometimes replaced by more sustainable ones. In terms of methodology, these studies often employ a qualitative approach which stresses that change is shaped through the interplay of a set of factors such as institutional setting, characteristics of technologies, and the distribution of key resources (finances, knowledge, natural resources). This approach provides an analysis at the level of the complete system, and is sometimes criticized for being less able to show how interactions among firms, governments and other societal actors shape inertia or change at the systems level.

At the SCI we are interested in advancing the methodological debate on longitudinal studies by developing an approach that addresses this criticism. This approach starts from the idea that processes of reconfiguration are in essence narrative, in the sense that they consist of sequences of events. Such events are constituted by interactions among actors around specific issues of interest. Rather than studying narratives that are made up of such events in a purely qualitative way, we seek to analyze them more formally as narrative networks. In that way, the analytical tools of graph theory and network analysis can be used to generate a deeper understanding, and compare systematically across cases.

At the SCI we are interested in advancing the methodological debate on longitudinal studies by developing an approach that addresses this criticism...

As an example, let me briefly describe a study of the Dutch chemical industry, which highlights the potential of this approach. In the mid 1980s, Dutch policy makers and industry representatives generally perceived environmental policy to be at a crossroads. Existing approaches, which leaned heavily on legislation and systems of permitting and monitoring, had reached their limit. Consistent with the wave of liberalization in that period, Dutch government initiated a program that explicitly aimed to internalize environmental responsibility into managerial practices. Rather than through external policing, emission targets and other goals were to be reached by handing the responsibility over to industry, coupled with the joint setting of targets in covenants.

In our study, we set out to test if this policy was successful in the chemical industry. Based on theories from environmental sociology and management sciences, we envisioned that the sector could develop along any of the following three scenarios:

1. ANCHORING: Dutch environmental policy, aimed at the internalization of environmental responsibility, has been successful, and attention for environmental issues has become anchored in Dutch chemical firms, as manifested in articulations and activities of firms.

2. TRANSLATION: while initially quite successful, repeated changes in the interpretation of policy targets and concepts have resulted in a 'translation' of the original goals, taking the chemical industry in a direction different from the one intended by the national government.

3. EVAPORATION: as a result of the dissipating energy of environmental policy makers, especially after 2000, actions and articulations of firms concerning ecological impact have diminished. The concern for environmental impact has become part of broader concepts such as sustainability and corporate social responsibility (CSR), and there is no evidence for business strategies in which ecological impact is taken into account in a structural way.

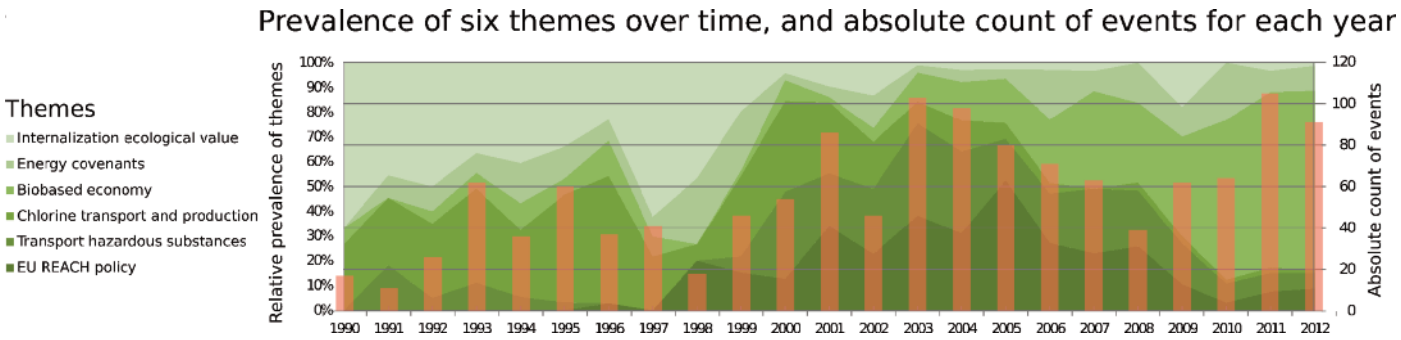

Figure 1. *Relative importance of selected themes in the Dutch chemical industry, 1990-2012*

We defined these scenarios in terms of typical interactions, the actors involved, and the issues (defined in their own words) they were addressing. So rather than assuming certain structures or topics and policy goals, we collected data broadly around the labels of 'chemical industry' and 'environmental impact'. This maximized the possibility to find interaction types, actors involved, and issues, to emerge, stay there for some time, and dissolve. Applying graph-theoretical concepts in novel ways, we then looked at main sequences of events, and interpreted them in terms of the scenarios listed above.

A major finding was that over time, specific themes emerged, while others dissipated. This is captured in Figure 1, which shows the main themes we identified and their relative importance throughout the period. Changing relevance is important, because each theme has a distinct 'profile' in terms of actors involved, and ways of interaction between these actors. So we see for instance that the theme of internalization becomes less important over time, while that of the bio-based economy becomes dominant at the end of the period studied. This is reflected in a change in ways in which actors interact, as well as the framing of issues. While internalization, and the regulation of chemical substances, is framed mainly in terms of reducing environmental impact, the bio-based economy is framed in terms of competitive advantage, both at the level of firms and that of the national economy.

Our study found evidence that the attention for environmental impact had not evaporated...

In all, our study found evidence that the attention for environmental impact had not evaporated; this was consistent with a reduction in environmental impact in the period we studied. The attention did change substantially though. The sector moved from a situation where its future (especially its use of chlorine as a feedstock) was the topic of confrontational interactions between environmentalist groups and industry, to a situation where industry pushed governmental agencies to support an innovation based strategy to promote the bio-based economy as a competitive advantage.

The results of this study, as well as others we have done, indicate that this is a promising methodological approach. In particular, it allows us to understand how dynamics at the systems level (such as the anchoring or evaporation of attention for environmental impact in an industrial sector) is the product not of one uniform process, but rather made up out of smaller sequences of interactions around specific themes. This understanding not only aligns with recent developments in theory; it also resonates with the experiences of actors involved in the processes of reconfiguration we study. They often see the smaller processes, and have difficulty in seeing the larger change that emerges from it.

Based on this insight, we aim to complement our analytical work with the development of policy tools that build on this advanced understanding of the dynamics of the processes of production and consumption. These tools should enable us to facilitate processes of reconfiguration to make production and consumption more sustainable. Our first experiences with such tools indicate that we are able to facilitate groups of policymakers and corporate decision-makers to reflect on long term processes in which they are involved (but of which they seldom have a complete overview), and help them develop more informed strategies, individually as well as collectively.

Acknowledgments

This article reports on work done in collaboration with Wouter Spekkink. Andrew McMeekin provided helpful feedback on a first draft.

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Flooding, Consumption and the Normality of Everyday Life

As summer takes hold, the wettest and warmest winter on records recedes into the background for many. But not for all. Of the thousands of questions asked over the winter of devastating floods across the North of England, one of the most important for people affected is presumably: should we stay, or should be go?

People describe being fed up of the now regular 'once in a lifetime floods' and some see the only option is to move from the area, however tough it may be to leave. Others cling to their homes and their communities, refusing to move, gradually piecing their possessions, and lives, back together again.

One vital aspect of people's resilience in the face of disruption to everyday life is consumption. Whilst many things destroyed in the floods hold sentimental value, replacing furnishings and consumables with like-for-like or new is widely achievable. Consumption plays an enormous role in transforming a house to a home and thus provides meaningful action in the process of making our lives go 'back to normal'.

The idea of 'back to normal' is important for discussions around sustainability, post-sustainability, consumption and production. An expression used in times of trauma or shock, it reflects certain beliefs about the past, present and future. It offers an insight into the everyday, mundane and commonplace - the things we take for granted. Indeed, 'normality' and 'common sense' are topics that have always interested sociologists—finding the unfamiliar in the familiar.

The proliferation of cheap mass consumables has been a defining feature of consumer societies over the last century. The consequences of replicability, mass consumption, planned obsolescence and affluence on imaginations of the past, the normality of the present and the (im)possibilities of the future have been regular themes in social science, and in popular culture by writers such as Don DeLillo. Consumption has come to form a central component in people's relationship to time in modernity and postmodernity.

Whilst the resilience of those in towns and villages affected by flooding continues, the issue remains that as extreme weather events become more common with human-induced climate change, continuing patterns of production and consumption, that is, going 'back to normal', will not suffice in the long term. Combined with the increase in destitution and the inability for many people to rebuild their lives as a result of flooding, the response to these events is of considerable importance.

The rhythms and tempos of consumption in the home, for example, replacing your sofa every five years, or replacing your kitchen every ten years, have been issues covered by many academics at the Sustainable Consumption Institute. In understanding how everyday life, consumption and action are structured in advanced capitalist societies, Dale Southerton points to the cyclical and ordered relationship between time and consumption and how they are spread differently depending on social class, culture and status.

How ordered patterns of consumption and production are changing through acceleration and disruption presents a major challenge for societies: climate change makes the relationship between time and consumption increasingly unpredictable. In times of disruption, how

are different groups of people using consumption as a form of resilience or adaptation?

Last month the head of sustainability at IKEA, Steve Howard, discussed these challenges, as well as what he coined 'peak stuff'. Western societies, in particular, he argued, need to change their whole system of production and consumption – with reducing, reusing and recycling seen as ways of mitigating resource depletion. He set out IKEA's commitment to providing more of these services in their stores, recognising the environmental dangers of current forms of global production and consumption. However, two primary concerns have been raised about Howard's account. Firstly, Western societies cannot be disentangled and separately managed from the world economy. Secondly, new product development still dominates the revenues and growth of businesses; particularly in the kind of industry IKEA operates in. Whilst schemes such as trade-ins and repairing will augment existing sales and marketing strategies, scepticism remains over whether they are likely to gain enough ground in time to meet carbon emission reduction targets set at the recent Paris Climate Summit and avoid catastrophic climate change.

At a policy forum in January, the chief executive of the Waste Resource Action Programme (WRAP), Liz Goodwin, echoed similar arguments to Howard. But she also criticised the Paris Climate Summit agreement for neglecting resource efficiency and waste reduction. Tied in with a recent European Environment Agency report on the 'circular economy' in Europe, the decoupling of economic growth from environmental degradation has gained increasing attention and momentum in policy and industry, as highlighted in the UK by the Courtauld Agreement, the voluntary grocery sector waste reduction and resource efficiency initiative.

The circular economy is increasingly being adopted as the panacea to the twin threats of economic stagnation and environmental degradation. Moving beyond narrow behavioural change responses to sustainability, it calls for a systemic approach from 'cradle to cradle'. The circular economy is promoted as the next industrial revolution, a systemic reorganisation of production and consumption that will usher in a new era of economic, environmental and social security. Researchers however have pointed to three spheres that need to given greater attention as the circular economy gains traction if the concept is to be critically examined: technocratic politics, environmental politics and the moral economy.

Rather than schemes and policies that aim to continue things as normal, such as Flood Re, a flood reinsurance scheme started in April this year, the unanswered and difficult questions remain [pdf]: if this keeps happening, does insurance cease to function with widespread insolvency? How will people rebuild their communities? Indeed, the recent floods caused in the North of England are estimated by KPMG to have cost £5bn. By contrast, a circular economy approach would promote possibilities around mutual ownership, renting and take-back schemes. The future of a 'sharing economy' may be forced on communities affected by climate change as the previous ways of doing things become increasingly strained.

On the 5th February, the Parliamentary Environmental Audit committee met to discuss Government responses to flooding. Whilst there was a much broader discussion on flood prevention through better policy instruments (like Flood Re) and water and land use projects than in previous years, there was still an expectation that given enough time, resources and knowledge the problem can be managed. In particular, by ensuring people are able to produce, exchange and consume in such a way that allows a sense of normality.

Of course the concerning thing about climate change, however, and what scientists have been warning us about for decades, is that some things we cannot control. Despite being the era of the anthropocene, we are unable to control the climate. As events such as the floods experienced in the North of England illustrate, the false dichotomy between leaving and staying will become more evident. The disruption of the floods brings home both people's understandable desire to 'get back to normal' and the increasing disruptions to normality we face. The irony is, to face the challenges of climate change, we can't carry on as normal at all.

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Best thesis award for Joe

Joe Blakey was recently delighted to be awarded the Royal Geographical Society (with IBG) Planning and Environment Research Group (PERG) award, an annual prize for the best Masters thesis in the field of planning and environment studies. The research took a critical look at how 'smart' urban governance negotiates different understandings of the city. In doing so, it evidenced how smart city design can create variegated geometries of empowerment. As a form of Participatory Action Research (PAR), this work was conducted with the Triangulum project, to try and understand how to better distribute the benefits of smart cities. The work was supervised by Professor James Evans in Geography (UoM).

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Researcher Spotlight...

Harald Wieser joined the SCI as a PhD researcher in September 2015. Most recently, he received the best abstract award at the AMBS PhD conference for his PhD research.

Can you tell us about the research you're currently working on?

In my research, I investigate how current replacement cycles of mobile phones have come about. Replacement cycles have become an intensively debated matter of conflict among different market agents, common perspectives ranging from technological enthusiasm to the perceived pressure to stay up-to-date and the environmental implications associated with short replacement cycles. I am thus specifically interested in the interplay between diverse actors across the market for mobile phones and how they mutually construct and negotiate the frequency with which phones ought to

be replaced. To this end, I am conducting a case study of the British mobile phone market, making use of secondary data from industry and consumer magazines, industry reports, and market research. The aim of this research is to improve our understanding of the economy's temporal rhythms and inform current debates around waste reduction strategies.

What other areas/projects have you been involved in?

Most recently, I have been working at the Austrian Chamber of Labour on a research project about the lifetimes and obsolescence of durable goods. In part, I am still working on this, currently writing up some papers. Previously, I also did some research on shopping practices for sustainable food and the socio-cultural values of ecosystem services.

What ignited your initial interest in these research areas?

The first time I seriously started thinking about the economy from a sustainability perspective was when I met my partner – an environmentalist - and this issue was raised in university courses. Without these influences, I might well have ended up in a marketing or economics department.

How has working at the SCI helped to develop your research?

Personally, I feel that my research has improved significantly since I started at the SCI. There are interesting crossovers between my research and the work of many SCI colleagues, which allows for an exciting exchange of ideas.

... Welcome to the SCI... Welcome to the SCI... Welcome to the SCI...

Wouter Spekkink

Wouter obtained his PhD in Public Administration in February 2016. For his PhD project, he studied the emergence and development of two inter-organisational collaborations on industrial symbiosis in the Netherlands. Through his PhD project Wouter also contributed to the development of Event Sequence Analysis (ESA), a longitudinal research approach dedicated to the investigation of social processes.

From January 2015 to June 2016 Wouter was employed as a postdoctoral researcher at Delft University of Technology, where he worked on the European GLAMURS project, with a focus on the role of citizen initiatives in the diffusion of green lifestyles. At the SCI Wouter will work on the further development of ESA, in collaboration with professor Frank Boons. He will provide methodological support to other researchers in the institute, but also set up new projects to explore possible connections between social practice theory as a theoretical perspective, and ESA as a methodological perspective.

Julie Kasmire

Julie started out studying Linguistics in California and Spain because she was intrigued to apply scientific methodologies to a topic as complex and nebulous as language. Finding that too straightforward, she then moved on to studying the Evolution of Language and Cognition in Scotland. Julie's PhD research in the Netherlands then carried on quite naturally to work on managing transitions to sustainability with a focus on greenhouse horticulture.

Her current research project sets out to examine change within industrial clusters from a process-based perspective. Julie hopes to develop a new methodology that allows researchers to look at events within such clusters as nodes in a network. She also hopes that this methodology, and her work in general, contributes in some way to process philosophy, changing the fascinating but unwieldy into something more practical and intuitive. Julie is expecting to begin this work by examining games of chess on the basis that chess games are complex systems with moves as events in a sequence and with complex relationships of threat and opportunity between the colours and pieces that shift with each move-event.