2014 SPRU DPhil Day Programme

DSkills Day: Research Challenges – Wednesday 7th May, 2014 – Jubilee 144

09.00-09.30: Registration and coffee

Jubilee Building, ground floor, adjacent to the Jubilee café

09.30-09.45: Welcome and introductions

Prof. Johan Schot, Director of SPRU

09:45-10:15: Challenges of researching non-market and grassroots innovation

Dr. Adrian Smith, Dr. Sabine Hielscher, Rachael Durrant, Mari Martiskainen, Jacob Barnes

Studying and working with grassroots innovators is incredibly fun. But focusing on challenges, we'll introduce the following: practical; conceptual; methods; positions. Here are some illustrations:

- Practically, grassroots innovators, and associated social movements, typically operate outside office hours and workplaces, and some can *appear* quite disorganised, so my colleagues and I often need to be very flexible and adaptable;
- Conceptually, not a lot of innovation studies literature derives from grassroots activity, nor does much grassroots social theory think in innovation terms, so we have to translate concepts carefully and guard against notions applied inappropriately;
- Methods, research demands attention from busy people working with limited resources and poor or non-existent data infrastructure, so we need to consider the demands involved in the methods we choose, and to be mindful about expectations and relationships with subjects, including mutual benefits from participation;
- Position, there can be grey areas between activism and research, and the challenge of working beyond discrete research projects and assisting on-going grassroots activity; at the same time, policy audiences can be interested in grassroots innovation for very different reasons, and want instrumental insights from research. So being reflexive, critical and retaining good relations with diverse groups can be a challenge.

10:15-10:45: Challenges of researching societal transitions

Dr. Florian Kern, Prof. Dr. Bernard Truffer

This sessions will outline why researching sustainability transitions is an exciting intellectual endeavour and has become a key area of development within the wider science, technology and innovation studies literature and related fields. Based on their experience of doing research in this field the two presenters will discuss a variety of challenges doctoral students might face in researching sustainability transitions. These include: interdisciplinarity, conceptual 'heaviness', the normative dimensions of research, the empirical messiness of transition processes, the risks of creating an insular academic sub-community with little purchase in standard disciplines, and getting transitions research published. While there are no easy fixes for any of these issues, we will discuss strategies for dealing with these challenges in a pragmatic way and would like to encourage students to reflect on these issues early on.

10:45-11:30: Coffee break

11:30-12:00: Challenges of cross-cultural research

Dr. Adrian Ely and Sam Geall

Many doctoral projects involve (sometimes prolonged) periods of overseas fieldwork, the success of which is vital to the research process. This session will discuss the main steps and some of the key issues in preparation for overseas fieldwork – academic and logistical. It will discuss some of the ethical questions that might be involved, often culturally-specific or determined by political-economic differences. The session will also cover some of the preparation required for remote fieldwork when the researcher is isolated from medical and other services that might be the norm in their home country. The speakers will draw on fieldwork experiences from China, Europe and Sub-Saharan Africa.

12:00-12:30: Challenges of researching scientific controversy

Prof. Andrew Stirling

Scientific controversies (eg: around GMOs; geoengineering; nanotechnology) offer fascinating insights into political and normative dimensions of science in policy and wider society. But they also raise particular challenges for research. In this presentation I examine some possible strategies to approaching the research of controversial topics, and touch upon some of the potential pitfalls. One potentially fruitful way into researching controversy is to ask about power. This is important, because this is at root, what controversy is all about. And the implications for research are especially salient in controversy, because power dynamics become less obscure than is normal in routine governance of science and technology. Yet it is largely power (in all its forms), that drives the fundamental directions in which science and technology progress in any given sector. Just as tectonics become most visible in earthquakes - it is in controversies, that political forces become visible, that otherwise lie buried beneath the undifferentiated 'sound science', 'pro-innovation' rhetorics that conventionally conceal these crucial issues around direction. In the presentation I will draw from some interesting experiences SPRU colleagues have shared with me over the years, the problems they faced and how they worked around them.

12:30-13:30: Lunch

13:30-14:30: SPRU in Conversation — Ben Martin and Johan Schot

14:30-15:00: Challenges of researching innovation and the firm

Prof. Paul Nightingale, Dr. Alex Coad

While the strategic management of technical change cuts across both governments and industry, innovation itself – the introduction and spread of new and improved products and processes in the economy - is something that is predominantly undertaken within firms. Studying firms is fraught with difficulty. We discuss the problems, and some of the solutions, that emerge in studying firms, externally as interacting and changing parts of sectors and the wider economy, and internally where organisations internal processes and structures are objects of analysis. We highlight methodological problems related to defining the unit of study, selection and other biases, as well as the 'craft' of engaging with managers and the difficulty of building and maintaining relationships and co-producing research. We discuss the difficulties of measuring innovation (R&D, patents, new products and processes, trademarks, etc) as well as difficulties measuring firm performance (survival vs trade sale vs failure; growth of employees vs sales vs profits, etc). We also touch on other important issues and biases affecting empirical work on firm-level innovation: data quality; unrepresentative samples & survivor bias; extremely skewed statistics; definitional flexibility; regression to the mean; selection bias; and also some interesting political biases.

15:00-15:45: The Risk-Reward Nexus

Prof. Mariana Mazzucato, Prof. William Lazonick

We present a framework, called the Risk-Reward Nexus, to study the relationship between innovation and inequality. We ask the following question: What types of economic actors (workers, taxpayers, shareholders) make contributions of effort and money to the innovation process for the sake of future, inherently uncertain, returns? Are these the same types of economic actors who are able to appropriate returns from the innovation process if and when they appear? That is, who takes the risks and who gets the rewards? We argue that it is the collective, cumulative, and uncertain characteristics of the innovation process that make this disconnect between risks and rewards possible. We sketch out key policy implications of the Risk-Reward Nexus approach.

15:45-16:00: Coffee break

16:00-16:45: Challenges of research impact and engagement

Prof. James Wilsdon

SPRU's orientation towards applied research which relates to real-world policy agendas chimes well with the prevailing mood in UK universities, which promotes - and increasingly rewards - impact and engagement with policymakers, businesses, NGOs and wider publics. What are the opportunities for building impact and engagement into your research career from the earliest stage? And what are the pitfalls and dilemmas? What new methods are there for engaging external audiences (including blogging and social media) and what are the emerging metrics by which research impact might soon be measured and assessed? James Wilsdon will describe the shifting landscape for impact and engagement that will increasingly influence the success or failure of research careers.

18:30-late: Event dinner

Stanmer House, RSVP required

DPhil Day: Slippery subjects – Thursday 8th May, 2014 – Fulton B, Jubilee 115, 116, 117, G31

	Fulton B
8.30-9.00	Registration
9.00-10.00	PLENARY: Welcome, introductions, elevator pitches

	Jubilee 115	Jubilee 116	Jubilee 117	Jubilee G31
	SCIENTIFIC SUBJECTS (Dr. Ohid Yaqub)	TECHNOLOGY & INNOVATION MANAGEMENT (Dr. Alex Coad)	ENERGY & TRANSITIONS I (Dr. Colin Nolden)	INTERNATIONAL DEVELOPMENT (Dr. Rose Cairns)
10.10-10.30	Shadreck Mwale (Sussex)	Alessandra Scandura (LSE)	Jila Bagherian (UEA)	Yusuf Dirie (SPRU)
10.35-10.55	Federico Vasen (Uni. N. de Quilmes)	Youngha Chang (SPRU)	Tillman Lang (ETH Zürich)	Paloma Bernal (SPRU)
11.00-11.20	Sara Peres (UCL)	Jang Saeng Kim (SPRU)		Yao-Martin Donani (Nottingham)
11.30-11.55	COFFEE (all rooms)			
	NEW & EMERGING TECHNOLOGIES (Dr. Ohid Yaqub)	INVENTORS, ENTHUSIASTS, AND ENTREPRENEURS (Dr. Alex Coad)	ENERGY & TRANSITIONS II (Dr. Colin Nolden)	TRANSPORT & MOBILITY (Dr. Philip Johnstone)
12.00-12.20	Carla Alvial Palavicino (Twente)	Martin Kalthaus (Friedrich-Schiller Jena)	Marton Fabok (Liverpool)	Rannevig Røste (BI Norw. Bus. School)
12.25-12.45	Alexandra Sexton (KCL)	Oliver Marsh (UCL)	Sjouke Beemsterboer (Maastricht)	Josefine Diekhof (Friedrich-Schiller Jena)
12.50-13.10		Annemarie Østergaard (Aalborg)		Fanny Paschek (Greenwich)
13.15-14.15	LUNCH (Jubilee 117)			
	GOVERNANCE AND REGULATION (Dr. Tomasso Ciarli)	QUANTITATIVE METHODS & MODELLING (Dr. Roberto Camerani)	ENERGY & TRANSITIONS III (Dr. Lucy Baker)	ENERGY & TRANSITIONS IV (Dr. Karoline Rogge)
14.20-14.40	Patricia de Vasconcellos (F. Uni. Rio de Janeiro)	Claire Carter (SPRU)	Kyounglim Lee (Cambridge)	Cian O'Donovan (SPRU)
14.45-15.05	Jacob Hasselbalch (Warwick)	Johannes Herrmann (Friedrich-Schiller Jena)	Andrea Smith (SPRU)	Magda Smink (Utrecht)
15.10-15.30	Véronica Roa Petrasic (SPRU)	Florian Senger (Fraunhofer ISI)	Michael Kattirtzi (Edinburgh)	
15.30-16.00	COFFEE (Jubilee G31)			

	Fulton B
16.30-17.00	PLENARY: Concluding comments, Ed Steinmueller

JUBILEE 115

10:10-11:30: Scientific Subjects

- **Shadreck Mwale** (Sussex, UK)
- **Federico Vasen** (Universidad Nacional de Quilmes, Argentina)
- **Sara Peres** (UCL, UK)

Discussant: Dr. Ohid Yaqub

Shadreck Mwale – *'Secret Subject and Invisible Participants: Doing research in corporate medical organisational settings'*

This paper examines the challenges of conducting social research involving pharmaceutical research organisations in the UK. It draws on experiences of conducting research for a PhD project on human involvement in clinical trials focused on regulatory, economic and ethical issues of first-in-human clinical trials. While within social research transparency and sharing of information is considered central to resolving social problems, the explicit ways in which secrecy surrounds the practice of clinical trials as themselves a form of research, relates to a theory of knowledge and ways of experiencing knowing that directly oppose these principles. This is because the organisation and practice of clinical trials, from a public perspective, is shrouded in secrets some of which may be justifiable some not. Specifically, this paper examines the ways in which trust, concealment and the gate keeping in 'contract research organisations' (undertaking trials on behalf of drug companies) shape knowledge production. The paper will examine the characteristics of key players in the early clinical trial process, and how this makes them hard to access. The paper asks: what is the value of social research if the research informants do not see value in it? Using data from interviews with both professionals and 'lay' healthy volunteer participants in clinical trials, email exchanges and documentary analysis the paper discusses the implications of secrecy on knowledge production and explores the relationship between secrecy and trust and ways in which trust is both built and tested in pharmaceutical research.

Federico Vasen – *Clinical trials in Argentina: from off-shore location to translational research*

During the 1990s, the clinical trial industry expanded its operations to developing countries in the search for lower costs and more available human volunteers (Petryna 2007). The preferred locations were Eastern Europe and Latin America, since medical facilities and training standards were not so distant from the ones in North America and Western Europe. In the Latin American region, Argentina was one of the first countries to set up a regulatory framework compliant with companies' interests and became the country with greater trial density in the region as of 2007 (Thiers, 2007). This outsourced activities led to a greater number of jobs for physicians and pharmacists and generated an important income of foreign currency for the local economy. But they also raised concerns related to the ethical justification of such research practices in human beings and the "foreign" nature of companies and CROs performing them. Latin Americans were not only "guinea pigs" but "guinea pigs" for foreign powerful companies. In the last years however a new trend in clinical research emerged in line with the discourse of "translational research" (Vignola Gagné, 2014). With the support of national STI policies, local pharmaceutical companies have begun to sponsor some clinical research that might lead to innovative local developments. Unlike previous trials that could be thought of "corporate science" (Schleifer and Penders, 2011), now there is public money for funding and local academic centers are involved. In the postdoctoral research I have recently started I aim to understand this emerging trend in clinical research in Argentina through the analysis of the STI initiatives devoted to this issue, regulatory frameworks, and representative case studies.

Sara Peres – *Think locally, see globally? A bottom-up enquiry into gene banking practices*

Gene banking is the storage of seeds and other plant material for the purposes of conservation and distribution for breeding, research or other uses. Although it was always an international effort to some degree, gene banking in the 21st century is represented as an international, collaborative effort to preserve our common heritage (see eg FAO, 2004). Scholarship on plant genetic resources conservation has provided economic, legal or policy analyses of gene banks (for instance, focusing on access or benefit sharing), but has received less attention from the social sciences. Here, an approach combining geographical and STS perspectives could be helpful in teasing out the implications of this global frame for gene

banking practices. The aim of this research, therefore, is to trace the links between these (including the management of plant germplasm collections), and sociotechnical arrangements at the international level, such as collaborative networks, common tools, and standards. In this paper, I will describe a methodology that works 'bottom up' by providing information on the international scale as it is understood locally, from the perspective of individual gene banks. Empirically, it draws from content analysis of documents and semi-structured interviews. Such an approach raises questions about scope, representativeness and access to data, and these will be addressed as part of a discussion of the issues and potential solutions encountered thus far. I will comment on the benefits and challenges of attempting to research at this scale, and conclude by reflecting on the importance of thinking geographically when making methodological decisions.

12:00-13:10: New and Emerging Technologies

- **Carla Alvial Palavicino** (University of Twente, Netherlands)
- **Alexandra Sexton** (KCL, UK)

Discussant: Dr. Ohid Yaqub

Carla Alvial Palavicino – *Futures, made-of: researching embedded anticipation in graphene.*

The Sociology of Expectations (SoE) has highlighted the role of promises, visions and expectations in the development of new technologies. In this context, more than the ontological status of the future, it is relevant to consider the forms and means in which the present is mobilized in the name of the future through these expectations. Expectations are 'performative', prospective structures to be filled by agency (van Lente, 1993). They distribute roles, create requirements, mobilize actors and resources and so on. Whilst the SoE has extensively described the dynamics and functions of these collective expectations, little attention has been paid to the ongoing practices in which these expectations are embedded. Practices, mediating between social action and structures, are the place where these expectations are 'performed' – which I will call embedded anticipation. This paper describes emergent coordination in graphene research by looking at the circulation of expectations through their performance and arrangement in various anticipatory practices. Graphene, a new material raised to fame in 2004 has been through a cycle of grand expectations and mobilization, which can be described as a hype. While the most salient dimension of this hype are the collective expectations (utterances about the future) that have circulated from science to semiconductors industry, experts, policy makers and the public, a second line of inquiry relates to the practices that enable the circulation and accommodation these expectations across such a diverse range of actors. By studying embedding anticipation (anticipatory practices) I would like to highlight the conditions that enable the emergence and circulation of these expectations and the resulting *de facto* coordination of innovation actors, accompanied by deliberate attempts to name and shape futures (foresight).

Alexandra Sexton – *Back to the Future: In-vitro meat, visceral reactions and incorporating future-imagining methodologies into academic research*

Conducting research on an emerging technology such as in-vitro meat (IVM) – a process that utilises tissue-engineering to artificially grow meat in laboratories – poses major challenges to the project's research design and methodology. To date, academic attention on IVM has been sparse and widely dispersed across fields ranging from geography, philosophy and the biosciences; consequently this project faces the significant challenge of situating itself within a background literature which itself is in the process of being formed. An element of future-imagining is thus necessary in order to anticipate the future environmental, sociocultural and political implications of IVM, which in turn can then inform the choice of existing literatures the project should engage with so as to produce an appropriate assessment of the subject. Understanding participants' opinions of IVM also requires a future-imagining approach, usually involving the engagement of their imagination and encouraging them to think about how they would feel and act in these future-based scenarios. Existing studies on other innovative technologies have identified future-based visual materials and textual descriptions as two effective techniques for stimulating participants' imagination in focus groups and questionnaires; however, such techniques do not effectively engage other important visceral experiences of food (i.e. taste, smell and touch), and as such may prove limiting in their ability to stimulate thorough future-imagining from participants. This paper thus seeks to explore the challenges of future-imagining in the research design process, of selecting effective methodologies for facilitating future-imagining with participants, and seeking ways of collecting and analysing participants' visceral responses.

14:20-15:30: Governance and Regulation

- **Patricia do Espírito Santo de Vasconcellos** (Federal University of Rio de Janeiro, Brazil)
- **Jacob Hasselbalch** (Warwick, UK)
- **Véronica Roa Petrasic** (SPRU)

Discussant: Dr. Tomasso Ciarli

Patricia do Espírito Santo de Vasconcellos – *"Introducing" Innovation to Regulators*

The aim of this paper is to highlight the challenges of discussing the role of the Brazilian Telecommunication Regulatory Agency – ANATEL – in promoting innovation. On the one hand, it focuses on the strategy to overcome the theoretical limits of the conceptual framework within regulation has been analyzed, mostly based on the market failure premise, that do not address significant parts of the process of innovation. So that, this research understands the regulatory agency as a player in the Systems of Innovation, analyzing it under the evolutionary approach. On the other hand, this research faces an additional challenge of bringing the discussion of promoting innovation to the Brazilian Telecommunication Regulatory Agency agenda. Despite its main function is, in theory, to guarantee competitive markets, it should be emphasized that the regulatory agency has also to promote and ensure the expansion of investment in R&D and the technological and industrial development. However, the discussion about the role of ANATEL and its effective contribution to R&D and Innovation policy has been mostly ignored. In order to expand the debate about the effects of regulation on telecommunications industry and operators innovative efforts, this research try to face the lack of policy coordination and insert the regulation into a broader innovation agenda by establishing a set of interaction of the regulatory agency with others governments agencies, firms, operators, research institutes (the main actors of the telecommunication innovation systems) and by discussing and drawing up with them guidelines that may improve ANATEL's policy.

Jacob Hasselbalch – *Conceptualizing the Regulatory Impact of Disruptive Innovation: Compression and Legacy in Professional Ecologies*

This paper reviews the literature on the political economy of regulation, and argues that increased attention to the roles of professions and time can bring greater analytical strength to the study of innovation. In particular, this paper is interested in the impact of disruptive innovations on regulatory capacity and process. This reverses the causal arrow generally assumed in the literature that deals with how regulation can support or foster innovation. The first part of the article reviews the literature on regulation, identifies some of its assumptions and clarifies how it deals with the concept of innovation. The second part of the article explains what is meant by disruptive innovations and how the current literature is ill equipped to investigate their regulatory impact. The third part of the article proposes a theoretical framework that is suited to redress some of the shortcomings identified by drawing on the ideas of linked ecologies and time horizons.

Verónica Roa Petrasic – *Policy Learning and Policy Change from Industrial Natural Resource Disasters*

This research examines how actors respond to an industry natural resource disaster through processes of policy learning and institutional change. In particular, it raises questions about the timing and policy responses of policy making process by posing the research questions i) How do industrial natural resource disasters precipitate processes of policy learning and policy change and ii) How are policy responses stimulated by industrial natural resource disasters developed and implemented? In the literature of policy learning and policy change some effort has gone into explaining policy change after catastrophic events (Birkland, 2006). However, we still lack a deeper understanding of this phenomenon due to a lack of conceptual frameworks required to underpin this analysis-which was the challenge for this research. This research attempts to fill this gap -and therefore overcome this challenge- by developing a framework that draws partly upon a broader literature relating to crises and disasters management (Faulkner, 2001). The research draws on the case of the Chilean salmon farming industry to demonstrate how a policy reform was triggered by a sanitary disaster that affected the industry between 2007 and 2010. It is argued that natural resource disasters evolve over time from a critical period of urgency to a period in which normality is restored (Faulkner, 2001). This suggests that policies may react differently according to the distinct stages of disasters and thus respond through different types of policy learning and policy change

according to the particularities of each stage. This also implies that policy responses to disasters are developed and implemented in different stages and with different consequences for society and industry participants.

JUBILEE 116

10:10-11:30: Technology and Innovation Management

- **Alessandra Scandura** (London School of Economics and Political Science, UK)
- **Youngha Chang** (SPRU)
- **Jang Saeng Kim** (SPRU)

Discussant: Dr. Alex Coad

Alessandra Scandura – *University-industry R&D collaboration and firms' innovative effort*

This paper investigates the impact of university-industry (U-I) research & development (R&D) collaboration on firms' innovative effort. U-I research collaboration is a specific channel of inter-organisational knowledge flows and potential spillovers from (and to) academic research aimed at carrying out specific R&D projects, particularly involving pre-competitive and basic research (D'Este and Fontana, 2007; D'Este and Iammarino, 2010; D'Este et al., 2013; OECD, 1998, 2002). There is a considerable policy interest in this subject, showed by the fact that U-I collaboration represents one of the most frequent policy instruments put in place by local and national policy-makers to foster pre-competitive research and firms' innovation activities (D'Este and Iammarino, 2010; Fisher et al., 2009; OECD, 1998, 2002). We aim at providing new evidence on the effect that collaborative partnerships have on private R&D, hence we test the hypothesis that project participation has a positive effect on firms' R&D activities, including R&D expenditure and intensity, and share of R&D employment. The paper exploits a novel source of data, made up of a set of U-I projects funded by the UK Engineering and Physical Sciences Research Council (EPSRC) in the UK between 1999 and 2007, matched with firm-level data collected from the Office for National Statistics (ONS)' databases. We employ propensity score matching on a year-to-year basis in order to select an appropriate control group of untreated firms on the basis of the probability that they participate to U-I partnerships, and estimate the impact (Average Treatment Effect on the Treated - ATT) of participation to U-I projects on firms' R&D variables. The preliminary results show a positive and significant impact on R&D expenditure and, to a lesser extent, on R&D intensity, across different years and estimation methods. The share of R&D employment of participating firms is also positively affected by the projects, although this result is less robust across time.

Youngha Chang – *The Strategy Making Process of Corporate Venturing: A Case of High-Tech Firm in Korea*

In order to achieve both sustainability and growth of a firm, incumbent firms in a changing environment continuously try to innovate themselves. Corporate venturing is a potential solution as a way of firm-level innovation, which involves developing ideas and establishing new business ventures within or outside a parent firm. Firms have been trying to utilise this activity with various motives and strategic objectives such as developing new products/services, creating new windows on technology, changing organisational culture. Despite its known benefits, however, corporate venturing entails risk and uncertainty, which are the inherent nature of innovation. Moreover, practitioners have difficulties in managing corporate venturing because of its complexity which may largely due to the lack of understanding of the strategy development process in different industries and different contexts. These problems and gaps in understanding lead managing corporate venturing and achieving economically viable outputs to be one of the challenging, but critical issues in technology and innovation management field, and this is why this research is attempting to find answers to the question of "How strategies are formulated in the activities of corporate venturing?" So, the proposed study is to develop better and more realistic conceptual model explaining the process of strategy formulation in the context of corporate venturing by conducting an in-depth case study aiming at understanding underlining mechanisms with the goal of positioning findings at the interface between the studies of innovation and strategy.

Jang Saeng Kim – *Knowledge Flow, Technological Dynamics and Intermediary Organizations: The Case of the Consumer Electronics Industry in Korea as a Newly Industrialized Economy*

Regardless of whether the neoclassical theory or the new growth theory, all agree that technology is a key determinant of economic growth. Many studies have shown that technological progress has a positive impact on productivity improvement and new product development, and it leads to innovation for development. In this context, literatures have

begun to focus on how to encourage knowledge activities: transfer, assimilation, diffusion, and exchange among/into firms. One of policy measures is to deploy intermediary organization (IO) such as incubator, cluster, public research institute, university and science park as a knowledge broker. Those IO can be an effective method to achieving Innovation, R&D commercialization, entrepreneurship, economic growth, and job creation. This DPhil thesis aims to analyze the role of international organization for knowledge activities and technology development in Korea. Why Japan has been struggling in its innovative works at the front, whereas Korea has been rapidly catching-up Japan in some industries and now it has become a world frontier and leads to forge ahead. This is the motivation of this work. Both quantitative and qualitative methods through empirical testing and theoretical study will be employed to analyze the economic benefits and costs of such intervention. The finding would help industrialization of latecomers in setting their policy directions and become an area of investigation by western observers in understanding the context of newly industrialized economies in Asia.

12:00-13:10: Inventors, Enthusiasts and Entrepreneurs

- **Martin Kalthaus** (Friedrich-Schiller Jena, Germany)
- **Oliver Marsh** (UCL)
- **Annemarie Østergaard** (Aalborg University, Denmark)

Discussant: Dr. Alex Coad

Martin Kalthaus – *Knowledge recombination and inventor characteristics in renewable energy technologies*

Major technological changes such as the transition of energy systems are driven by major technological discontinuities and the related inventive activities behind that. Crucial to invention is the recombination of different pieces of knowledge. Schumpeter (1934) pointed out already, that it is the entrepreneur or the entrepreneurial firm that manages this recombination to form something new. While this process of recombination is well understood for a population of firms (e.g. Kogut/Zander 1992, Antonelli et al. 2010), the actual knowledge recombination takes place at the inventor level, which needs to be elaborated further. Here Gruber et al. (2013) show that scientists are better in integrating distant knowledge than engineers, which is important for more radical innovations (Schoenmakers/Duysters 2010). The research questions pursued in this paper concern the relationship between the value of inventions on a new technological trajectory and the competencies and knowledge of inventors. We use patent data for wind and photovoltaic technologies for the period from 1980 until 2005 to elaborate on the inventor's characteristics and how they influence the technological value of a patent. We are interested in whether actors which are experienced in technologies closely related to the new technology, experienced in unrelated technologies or those which have no previous experiences are the major drivers of the technological change. It is here the first and second group which accomplishes invention via recombination and we assume that it is the first group of inventors whose recombination effort results in the highest valued patents. For each of the inventors we construct the personal characteristics in terms of his knowledge stock, his breadth of knowledge and how his knowledge is related to the field he is working in. We use regression analysis to estimate the effect of the inventor's characteristics on the value of patents.

Oliver Marsh – *Optimal Screen Resolution: Multiple Methodological Scales in Internet Research*

Contemporary social scientists are frequently warned of the challenges of interdisciplinary research. For internet researchers, these warnings are well-placed. In this paper I discuss a particular challenge in my research into impacts of online science enthusiast communities on mass media debates over science policy, alternative medicine, religion, and suchlike – also known as the 'geek movement'. I call this challenge the *problem of scaling*: one can study the internet at many scales, from the individual playing with a digital device all the way up to global networks. In my project I need to cross multiple scales: to understand how different online science enthusiast communities relate to one another within the geek movement I have to recognise the divergent forms of these communities; but to understand how and why these diverse communities emerge I must consider the motivations and identities of individual members. This requires a combination of methodologies – from participant interviews of members, through ethnographies of communities and content analyses of their interactions, up to network analysis of the geek movement. As well as creating a large workload, existing exemplars of these methods come from fields with differing – often conflicting – theoretical commitments, so their synthesis could require complex critical reflections. In addition, I must consider how each methodology might rely on, or

should be kept separate from, the others. I consider ways in which these problems might be minimised, allowing me to appropriately attend to all the necessary variables in this project within a manageable workload.

Annemarie Østergaard – *The challenges of measuring the entrepreneurial personality: A methodological approach*

Currently, the entrepreneurial personality is measured with outdated or invalid measurement tools and without clearly defined units (Davidsson, 2005; 2008; Gartner et al., 1994; Gartner, 1989). Moreover, the precondition before measuring is often neglected. Consequently, the aim of this paper is to outline the primary challenges of the entrepreneurial personality followed by suggestions on how to overcome the measurement challenge by adding new knowledge. Among others, the diverse elements of entrepreneurial personality attributes are presented in a model to make the concept more manageable, including how to integrate and differentiate the elements. On the subject of measuring the entrepreneurial personality in a valid and reliable way, the overall challenge is to specify: why the personality is relevant to measure, which part of the personality is entrepreneurial, which parameters of the personality are actually measurable, with which current measurement tools and how to do it properly. Focusing directly on the challenges, this paper suggests new measurement avenues for the entrepreneurial personality by presenting solutions.

14:20-15:30: Quantitative Methods and Modelling

- **Claire Carter** (SPRU)
- **Johannes Herrmann** (Friedrich-Schiller Jena, Germany)
- **Florian Senger** (Fraunhofer ISI, Germany)

Discussant: Dr. Roberto Camerani

Claire Carter – *Net energy availability due to changes in global energy supply systems: Implications for economy and climate change*

Net energy or energy surplus is the difference between the usable energy (energy output) and the total energy consumed by the energy system to deliver it (energy inputs). Energy inputs include both the embodied inputs in capital equipment and machinery such as drilling rigs, and the operational energy used say to pump oil. Net energy exceeding basic human needs facilitates economic expansion and therefore changes in this surplus can have important implications for economic activity. Evidence suggests that the average energy surplus from fossil fuel sources is declining. This is due to relying increasingly on poorer quality resources and in more difficult locations. Many countries are also encouraging the expansion of renewable energy sources in order to reduce emissions of greenhouse gases. The energy surplus obtained from renewable sources tends to be less than for conventional fossil fuels plus they differ in the relative timing of energy flows. These differences and trends could become important in a transition to a low carbon economy. Changes in energy surplus over time and complex feedbacks and interdependencies need to be captured. System dynamics modelling can investigate such dynamic changes and explore the behavior of complex systems over time. By modelling the interdependencies between different variables and the impact of feedback loops, long-term system-level behavior can be captured in a more effective way than conventional modelling approaches. This research project will therefore construct a system dynamics model to simulate how the net energy in the global energy supply system and its overall greenhouse gas emissions levels may evolve over the period to 2050 and the implications of this for the wider economy.

Johannes Herrmann – *Evolution of the electricity market in Germany: Identifying policy implications by an agent-based model*

The diffusion of renewable electricity generating technologies (REGT) is seen as a crucial part for establishing a sustainable energy system. However, the current energy system is designed for and locked into the usage of fossil fuels, so that the desired transition is unlikely to be achieved by market forces alone. Using an agent-based model, we analyse how this transition can be efficiently supported by the policy mixes instruments and what possible side-effects of long-term political support for REGT might be. For this, we model two interconnected markets, one for electricity and one for electricity generation equipment. In the electricity market, heterogeneous consumers buy electricity from electricity producers. We use a specific feature of REGT, namely the possibility of decentralised small-scale electricity production, to model the possibility of consumers becoming independent from the electricity grid. This is possible after a radical

innovation in the market for electricity generation equipment, which will make electricity storage technologies available during the course of the simulation. REGTs can become cheaper and more efficient based on innovation and learning effects, which are both linked to how much REGTs are sold in the market for electricity generation equipment. The policy maker can implement different policy instruments to influence the development of the two markets. The costs for all instruments are laid upon the electricity price in the electricity market. A point of high interest is how the policy makers can react to emergent market conditions, which are unforeseen side-effects of the policy instruments implemented.

Florian Senger – *Regime changes in socio-technical systems: applying an agent-based model to changing mobility concepts in Karlsruhe, South Germany*

In the PhD Thesis presented here I combined methods from physics of social systems with methods from evolutionary economy to develop an agent-based model that is supposed to mimic the dynamics of regime changes in socio-technical systems. I therefore modelled the demand side as consumer agents according to a distribution of endowments and needs, connected to each other in a social network, influencing each other in a voter-model-like manner and choosing the technology and company they think suite their needs best. For the supply side I modelled explicit company agents consisting of genes in an evolutionary sense, producing a technology in a quality depending on their particular fitness, taking influence on particular areas of the consumer network via marketing and changing the allels of their genes by a process of imitating and stochastically innovating, getting feedback on their fitness by the degree of success with the consumers. I will show here the results so far with different realisatons of the model, especially different network topologies and give an outlook on how the model will be applied to the real case study of changing mobility concepts in the region of Karlsruhe in southern Germany where we try to develop a methodology to analyse the social network of mobility consumers.

JUBILEE 117

10:10-11:30: Energy and Transitions I

- **Jila Bagherian** (University of East Anglia, UK)
- **Tillman Lang** (ETH Zürich, Switzerland)

Discussant: Dr. Colin Nolden

Jila Bagherian – *A Multi-Level Perspectives Towards Energy Regime Transition: A Wind Energy Case Study*

This study investigates and analyses potential factors that influence the energy regime transition process from traditional fossil fuels to wind energy towards sustainability. By applying socio-technical theories, the study develops a theoretical framework to analyse the interplay between social and technical levels within the process of energy regime transition. The framework emphasises the social groups' perspectives at meso-level and how external factors at macro-level and effect of technological innovation at niche level affect the energy regime transition process. The purpose of adopting and developing a theoretical framework based on socio-technical theories is to apply in real world (context) to see how the conceptual and theoretical understandings of wind energy as an innovative technology and involved factors within socio-technical system effect the wind energy diffusion. This study adopts and develops the multi-level perspectives (MLP) model to determine and to analyse key factors. The MLP model is used to explore the role played by social groups in influencing the implementation of wind energy within energy regime transitions and their interpretations of the effect of these factors on energy regime transitions. This study intends to design a contextual case study as research approach by using qualitative semi-structured interviews technique to extract different social groups' perspectives while different factors influence on their interpretations.

Tillman Lang – *On the evolution of firm capabilities in market transitions: the case of policy phase-outs in the photovoltaic industry*

Many countries have adopted deployment policies to support the development of clean energy technologies. As these policies are being reviewed and potentially phased-out over time, the industrial levels of uncertainty, munificence and complexity undergo substantial change. This raises the question of how firms reconfigure their capabilities over time to navigate through such turbulent industry transitions. In a multi-case study we analyze how firms' capabilities evolve due to changes in their environment's uncertainty, munificence and complexity. We focus on the German solar PV power plant industry, where policy was the dominant factor in shaping organization's environments. We find that in early market phases policy-based investment incentives led to low levels of uncertainty and complexity, whilst creating a munificent market. Associated capabilities included efficient engineering, construction, and sourcing. Local interconnectedness was required to facilitate permitting processes and access to valuable projects. When policy support was reduced, munificence fell sharply while uncertainty rose. Flexible capacity management evolved as a key capability to first benefit from pre-policy-phase-out market growth and then react to substantial demand drops. Dynamic capabilities deployed in this phase included outsourcing, vertical consolidation, and geographical and technological diversification. A major implication stems from the observation that while uncertainty and industry dynamism were low, firms could rely almost exclusively on exploitative capabilities. These capabilities needed to be modified when policy changed. This implies that a focus on exploitative capabilities in times of policy-driven growth might constrain firm's abilities to survive a sudden fundamental market transition, as triggered, e.g., by an unexpected policy-phase-out.

12:00-13:10: Energy and Transitions II

- **Marton Fabok** (University of Liverpool, UK)
- **Sjouke Beemsterboer** (Maastricht University, Netherlands)

Discussant: Dr. Colin Nolden

Marton Fabok – *Low-carbon transitions and the politics of geographic scale: The case of Anglesey Energy Island*

The sociotechnical transitions approach, and in particular the Multi-Level Perspective (MLP), has received criticism from human geographers for neglecting the spatial patterns of niche-formation, regime and sociotechnical landscape (Coenen et al. 2012, Bridge et al. 2013). The energy transitions in the UK are not uni-directional, but exhibit rather various interconnected and differentiated geographical patterns (Smith 2007; Hodson and Marvin 2013). The case of Anglesey Energy Island highlights the importance of local struggles for Welsh identity and livelihood, interferences of the policies defined on the county, Welsh, UK and EU levels, not to mention strategic cooperations between local businesses, national construction companies, multinational utilities and nuclear vendors. Highlighting multi-scalar creates a much more complex picture for the definition of Anglesey Energy Island than a nested hierarchical framework would suggest. Is the new nuclear plant project, recently renamed to Wylfa Newydd, a vehicle to keep the local youth in the island and to maintain Welsh language or an instrument of the City of London and global capital markets? How do various scales of governance interact with each other? How does the politics of scale add to the understanding of low-carbon transitions through the example of Anglesey?

Sjouke Beemsterboer – *Analysing knowledge inputs to sustainability assessments of concentrated solar power*

Global issues surrounding climate change and energy security have increased public interest in a transition towards a more sustainable energy system. Sustainability assessments play a role in this discourse by allowing planners to steer efforts towards positive sustainability contributions. A recurring theme in the assessment literature is the dependence of good decision making on the inclusion of different perspectives. It is also recognised that some perspectives are not equally represented in the assessment outcomes. Differences in the power and participation of actors are rightfully emphasised as causes, but leave out another fundamental question to knowledge integration. Are there characteristics inherent to the knowledge generated by certain actors that hinder their inclusion in assessment outcomes? The intuitive answer of those familiar with this matter might be affirmative. Yet, it is neither known which characteristics of these knowledge inputs matter most for their final use in assessments, nor how to study them in this respect. In my research, I focus on adopted sustainability goals, adherence to normative criteria for sustainability, and inclusion of different interpretations of time, space, technology and the context of decision-making. The empirical domain used to illustrate this problematic is concentrated solar power (CSP), a renewable energy technology based on thermal heat conversion of solar energy. The key challenge in my research will be to choose the right research methods. Considering the richness of generated knowledge, how can I find out which characteristics to knowledge inputs matter most?

14:20-15:30: Energy and Transitions III

- **Kyounglim Lee** (University of Cambridge, UK)
- **Andrea Smith** (SPRU)
- **Michael Kattirtzi** (University of Edinburgh, UK)

Discussant: Dr. Lucy Baker

Kyounglim Lee – *Explorations of renewable energy policy for achieving sustainable development, focusing on how to fill the gap between science and policy in wind energy electricity policy making of the UK, Germany, and Korea*

The aim of this thesis is to find how to make renewable energy (RE) policies contribute to sustainable development (SD). This dissertation will clarify the SD concept and suggest the role of science in the renewable energy policy making process. The specific case of wind energy for electricity will be focused with ethnographic description. Currently, RE is being promoted as a solution for energy crises. Although RE is generally believed to be sustainable and its policies are scientifically based, some energy policies have been inadequately implemented despite the national initiative in Korea, and in the UK there have been sudden delay in subsidies. To explain these situations, two literature streams are reviewed: Firstly the SD concepts, such as the three ring and triple bottom line models, and secondly policy making based on scientific evidence addressing the effect of uncertainty, value and sociotechnical imaginaries, and the role of advisors. Moreover motivation and leadership are studied as substantial factors in policy making. As a result, resilience and robustness, terms from the study of ecology, can be proposed as hypothetic prerequisites in establishing the concept of SD

in RE. Furthermore, detailed effects of the above mentioned factors on SD should be explored. This research is based on case studies, which are useful in building new theories as well as in testing a hypothesis. The German FIT, British auction and obligation, and the blending of these two measures in Korea will be studied.

Andrea Smith – *Renewable energy certification, GHG mitigation, and cognition theory*

Renewable electricity certificates guarantee that units of renewable electricity (RE) have been supplied to the grid. Some companies purchase these certificates in order to report reduced greenhouse gas emissions associated with their grid electricity consumption. Use of these certificates is, however, controversial with ongoing debate among the epistemic community of people concerned with GHG emission quantification on how purchase of these certificates should be represented in company GHG inventories, known more commonly as carbon footprints. One claim is that their purchase has not led to little extra RE projects above what would have been installed due to regulation. My research will use semi-structured interviews with RE investors and developers to understand what has been the impact of these certificates within the EU on installed capacity. I will also use a case study approach to examine a second concern: that purchase of these certificates may displace more widely-accepted measures that companies can take to reduce their emissions e.g. energy efficiency and demand reduction and reduction of emissions from processes such as leaks natural gas transportation. I shall use cognition theory, popularised by in *'Thinking, Fast and Slow'* (Kahneman, D. 2012), to examine how decisions on the GHG mitigation measures are made.

Michael Kattirzi – *The politics of talk*

Qualitative social and behavioural science research has played an increasingly prominent role in the UK government's efforts to tackle climate change since 2001. But the role, values and meanings of 'social research' in government have varied over this time period, along with changes in the social, political and institutional contexts. This PhD aims to understand these changes within the government department for environment, food and rural affairs (DEFRA) and the department of energy and climate change (DECC), since DEFRA's establishment in 2001. Researching the history of 'social research' within DEFRA and DECC is not easy. Interviews with civil servants are performative and it takes two to perform them. I find civil servants tend to not say more than necessary, though occasionally I learn more than I should. Interviews with academics are not always better - sometimes they open up too many questions, and other times they just close down the discussion. All the while I aim to maintain impartiality, reflexivity and focus. With practice I get better at controlling and/or handing over the discussion. Despite (and because of) some surprises, my first phase of fieldwork has been fruitful. I can begin to account for changes in the role, values and meanings of social research in DEFRA and DECC. The challenge now is to reflect on what my findings mean for different audiences. Without saying more or less than necessary, I hope the SPRU DPhil day will help me to open up problems and perhaps even close in on some solutions.

JUBILEE G31

10:10-11:30: International Development

- **Yusuf Dirie** (SPRU)
- **Paloma Bernal** (SPRU)
- **Yao-Martin Donani** (University of Nottingham, UK)

Discussant: Dr. Rose Cairns

Yusuf Dirie – *Progress as Alibi? Framings of Pastoral Development in the Horn of Africa*

This study seeks to understand how the development of pastoral systems in the Horn has been framed and how these framings have shaped development policy, since the 1980s. The history of pastoral development in the Horn of Africa has almost all been framed as series of failures. Pastoralists were framed as irrational, their traditional systems inappropriate, and the ecosystems in which they live stable until destabilised by their actions. These framings supported development interventions which sought to 'solve' the pastoralist 'problem' - a move which in its extreme sought to 'eradicate pastoralism'. During the eighties and nineties, new ideas about pastoralism began to emerge. Most significant, was the recognition of pastoralism as the livelihood best suited to the African drylands. Despite this; narratives of 'chronic vulnerability' and recurrent 'crisis' continue to dominate discussions; whilst governments in the Horn have continued to portray pastoralism as an outdated livelihood. Conversely, in 2010 the (unregulated) livestock related trade emanating from pastoral areas in the Horn was estimated at over a $1billion (USD). It is important to note that this substantial trade was neither dependent on the state or aid, but rather pastoralists ability to effectively innovate and respond to market opportunities.

Paloma Bernal – *Sustainable livelihoods, social capital, and the Colombian oil palm sector*

Sustainable livelihood (SL) approach has become central in the debate of rural development. In this framework, capital assets provide the material and social inputs to obtain desirable livelihood outcomes whilst adaptive capacity is one of the key elements by which households can become more resilient and less vulnerable to environment, climate, and socio-economic stresses. In this discussion, too little emphasis has been placed on the role of social capital (SC) in building livelihood strategies and facilitating adaptation and adaptive capacities. Questions of SC about its formation, operation and utility need to be addressed, understanding the generic capacities in a community that enable self-protection and collective action. In my research, I'm going to deeper into SC theory –specially on the networking and the synergy views— and fill the existent gap between two approaches: the first approach supports dense network links, closed and homogeneous communities; on the contrary, the second approach states that SC is the result of structural holes, open and heterogeneous communities. This analysis will help to answer the question about how the different balance between types of SC (bonding, bridging and linking) influence the building of adaptive capacity strategies of small scale growers to cope socio-economic and natural stresses. This implies a major study of issues such as innovation and social learning process in communities of place and communities of practice and discussion of inclusion of agents in decision-making practices of adaption strategies. My case of study will focus on small growers and their social network in the Colombian oil palm sector which, nowadays, are exposed to natural (e.g. plant diseases) and socio-economic (e.g. conflict and high dependency) stresses.

Yao-Martin Donani – *Challenges in researching a new approach for technology development in Africa: the case of Ghana*

The socio-techno-economic development in Africa has been a concern to social scientists, economist and politicians since record began. The African problematic, therefore, stands as a chronic global challenge, defying international conventional development approaches. These approaches typically focus on technologies acquisition (often capital-intensive and high-tech) and developing partnerships between institutions in developed countries and their leverage organisations in Africa. Such conventional methods have yielded disappointing results. Observably, they are all of non-African initiative, thus, devoid of local cultural content. Though Africa is seen to be experiencing an unprecedented economic growth, economists describe it as fragile and superficial; lacking the 'techno' component. This being that the continent is characterised by a

lack of technology development. This therefore calls for an approach for technology development which will cut across cultural, social and ethnic barriers for indigenous participation. The methodology employed involved ethnographic study of selected communities in Ghana and interviewing policy makers from governmental organisations. A narrative constructed, uncovered a three-step methodological approach for technology development in Africa, leading to the concept of *development engineering*. The three-step approach challenges the conventional methods earlier mentioned. Some challenges encountered in the research were communication barrier in identifying the right local communities and liaising with policy makers as respondents. In many cases, after the difficulty of securing an appointment for interview, the respondents claim not to have time, hence rushing the interviews and making the flow of discussions difficult. Impacts of such challenges were however reduced by making further contacts.

12:00-13:10: Transport and Mobility

- **Rannevig Røste** (BI Norwegian Business School, Norway)
- **Josefine Diekhof** (Friedrich-Schiller Jena, Germany)
- **Fanny Paschek** (University of Greenwich, UK)

Discussant: Dr. Philip Johnstone

Rannevig Røste – *Multi-level dynamics in wicked problems: lessons from a public service innovation in sustainable transport*

Climate crisis and need for transport are one of many wicked problems confronting public planners. These are pressing public problems of which there are no simple technological and economical solutions. Public sector is appointed to play a crucial role in solving such problems. Solutions can be attained through regulation and control, but public sector is also expected to create new solutions and services. Recent literature on innovation in public services calls attention at wicked problems, but theoretical understanding is still limited (Bekkers 2011; Osborne and Brown 2013). Yet, the emerging perspective of innovation in governance (Hartley 2005; Benington and Moore 2011) emphasises how innovations are parts of larger complex public production systems, which are collective oriented in creating public values for better societies. This paper contributes to understand the dynamics of wicked problems by studying how new public services are created in co-evolutionary processes of public value in public service systems. In studying co-evolutionary processes, the paper applies the multi-level perspective of socio-technical transitions (Geels 2004; Geels et al. 2012), framing processes of innovation in three analytical levels, of niches, socio-technical regimes and landscapes. The multi-level dynamics is explored in a process study of a public service innovation in sustainable transport. The study shows how the new public service for electric vehicles in the city of Oslo developed out of temporal political, societal and technological processes, co-evolving with long-term institutional processes of public values of sustainable transport.

Josefine Diekhof – *Do Entrants Increase Incumbents' R&D Activity? Escaping the Lock-In, Spurring Technological Change and the Transition towards Sustainability within the Automotive Industry*

Evolutionary economists highlight that entrants as well as incumbents play different but essential roles in transitional processes. Entrants are claimed to spark the transition by introducing disruptive innovations. Incumbents are initially in favor of the dominant design but once motivated to introduce the disruptive technology as well, only they achieve mass market penetration, given their strong innovative, financial and influential power. This paper analyses this mechanism via data on environmentally friendly technologies. For that it is assumed that entrants' key role is not merely the introduction but rather that they spur incumbents to reallocate their R&D activity towards environmentally friendly technologies. The analysis considers R&D entry of lateral and upstream entrants as well as start-ups and spin-offs. Ordinarily, incumbents consider only a small proportion of entrants as challenging; but being partly from different industries, entrants can leverage competences new to the industry and crucial for technological advances. They further stimulate the initial demand, master technologies in niche markets and eventually signal governments and incumbents the maturity of the technology for mass market adoption. At that stage, entrants are recognized by incumbents and by their innovative performance they are expected to facilitate overcoming lock-in phenomena by stimulating incumbents' R&D. These relationships are tested for the automotive industry, which currently faces a transition from combustion engine vehicles towards electrically powered alternative technology vehicles (ATVs), providing lower or zero-emission drive systems. ATVs are claimed to become a disruptive technology which may destroy the technological and economic structure of the current vehicle system. Using patent data, this study seeks to econometrically test whether ATV related R&D entrants

increase incumbents' R&D on ATVs. Following previous findings, incumbents are expected to respond heterogeneously, depending on their R&D productivity. Extending current literature, the analysis accounts for cross-country entrants, product-level effects and seeks to shed light on the effects imposed not only by quantitative but also by qualitative entry forces, entrants' absolute number in contrast to knowledge stock and technological relevancy. Preliminary results support the postulated hypotheses: incumbents' positive and heterogeneous responses and a stronger reaction on qualitative as opposed to quantitative entry forces.

Fanny Paschek – *Urban transport, geographical scale, and the* social *of socio-technical transitions*

Socio-technical transition studies have successfully identified barriers and alternative pathways to sustainability transitions in a variety of contexts. According to critics, however, research progress may be stalling due to unduly thin conceptualisations of *social* context in what asserts to be a theory of *socio*-technical transitions. This research in progress conceptualises socio-technical transitions in urban transportation systems as processes conditioned by context-specific political and social relations. Focussing on moments in on-going socio-technical transitions and deploying concepts originally developed by Sum and Jessop in the context of Cultural Political Economy, the research investigates how transition processes are mediated through the interaction of structural, agential, discursive and technological (i.e. rule regime) selectivities at multiple geographical scales. The project seeks to evaluate the potential for successful transitions in urban transport systems by investigating how selectivities at varying scales may respectively privilege the reproduction of existing regimes or enable the transition to new regimes. The particular challenge at this stage is one likely faced by many multidisciplinary studies at the interface of science, technology and society: The skilful deployment of, in this case, resources developed in the context of critical political economy for research on socio-technical transitions in urban transportation systems. Whilst Sum and Jessop explicitly aspire for their concepts to be transferable across disciplines, it remains the duty of the 'borrower' to deploy them prudently to avoid frailties such as disciplinary imperialism or eclecticism.

14:20-15:30: Energy and Transitions IV

- **Cian O'Donovan** (SPRU)
- **Magda Smink** (Utrecht University, Netherlands)

Discussant: Dr. Karoline Rogge

Cian O'Donovan – *Green energy systems playing catch-up: where is the innovation?*

This research considers the "touching down" of technological innovation systems (TIS) and asks "where do system functions come from?" I seek to make a contribution by critically examining phases in the development of a TIS. I consider disaggregating and distributing, spatially and temporally, the TIS and the formation of a "local" TIS in conjunction with the touching down of functions and components of a "global" TIS. Using a case study of the roll-out of wind technologies in Ireland, I ask why do green energy systems emerge in catch-up nation contexts, whose interests matter and where are these located?

Magda Smink – *Incumbent vs. pioneer system-building*

An important element in transition processes is the relative influence of new entrants as opposed to incumbent actors. Incumbents are assumed to have more resources and more influence. Transition studies have traditionally focused on the activities and processes on the side of the new entrants or pioneers. In contrast, this paper focuses on the activities that Dutch energy incumbents employ to build supportive system structures for biomethane (biogas upgraded to natural gas quality). We then analyze how these activities compare with (previous) system-building by biogas producers. Our data consists of 9 semi-structured interviews with the relevant organizations; a newspaper database; policy documents; and websites. We have analyzed these data for recurring patterns in system-building activities and ordered these patterns into three categories: network creation; institutional change, and knowledge creation and diffusion. The results show that incumbents' involvement correlates with a different dynamic in the development of these three categories. Once incumbents stepped in, large structural changes occurred, e.g. in the renewable energy subsidy scheme. In the analysis we highlight the different styles of system-building. Most notably, incumbents cooperate with the government in public-

private networks and thus can influence public policy thorougly and in an early stage. In contrast, pioneers unite only with peers and try to repair disadvantageous policies in a (too) late stage. Finally, we conclude that involvement of incumbents can greatly speed up innovation/transition process. However, the resulting focus on large-scale operations may be at the expense of pioneers.

Appendix I: List of Second Day Presenters

Jila Bagherian (University of East Anglia)

Sjouke Beemsterboer (Maastricht, Netherlands)

Paloma Bernal (SPRU)

Claire Carter (SPRU)

Youngha Chang (SPRU)

Josefine Diekhof (Friedrich-Schiller Jena, Germany)

Yusuf Dirie (SPRU)

Yao-Martin Donani (University of Nottingham)

Marton Fabok (University of Liverpool)

Jacob Hasselbalch (University of Warwick)

Johannes Herrmann (Friedrich-Schiller Jena, Germany)

Martin Kalthaus (Friedrich-Schiller Jena, Germany)

Michael Kattirtzi (University of Edinburgh)

Jang Saeng 'JS' Kim (SPRU)

Tillman Lang (ETH Zürich, Switzerland)

Kyounglim Lee (University of Cambridge)

Oliver Marsh (University College London)

Shadreck Mwale (University of Sussex)

Cian O'Donovan (SPRU)

Annemarie Østergaard (Aalborg University, Denmark)

Carla Palavicino (University of Twente, Netherlands)

Fanny Paschek (University of Greenwich)

Véronica Roa Petrasic (SPRU)

Sara Peres (University College London)

Rannevig Røste (BI Norwegian Business School, Norway)

Alessandra Scandura (LSE)

Florian Senger (Fraunhofer ISI, Germany)

Alexandra Sexton (Kings College London)

Magda Smink (Utrecht University, Netherlands)

Andrea Smith (SPRU)

Federico Vasen (Universidad Nacional de Quilmes, Argentina)

Patricia do Espírito Santo de Vasconcellos (Federal University of Rio de Janeiro, Brazil)