“THEORIES OF CHANGE IN SUSTAINABILITY TRANSITIONS”

Proceedings - II Pressure Cooker

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I. The role of agency in social and sustainable transitions

Adina Dumitru, Ricardo Garcia Mira, Niki Frantzeskaki

The second Pressure Cooker, hosted by the People-Environment Research Group of the University of A Coruña (Spain) and the GLAMURS project, coordinated by Prof. Ricardo García Mira, gathered together representatives of nine European projects. All projects study, from a variety of scientific perspectives, the mechanisms through which effective societal transformation towards sustainability can be achieved, and they all tackle the role of individual and collective agency in sustainability transitions. They also have in common the study of a wide range of sustainability and social innovation initiatives and networks across Europe and beyond and focus on their role in complex processes of sustainable change. The rich discussions of the symposium were focused on the following research questions:

- What theories of change do initiatives hold and how do they influence their action and experience?
- What do different pathways of transition to sustainable societies reveal about mechanisms of large- scale societal change and what is the role of different types of actors in these processes?
- How do these theories of change play out in processes of collective agency and empowerment?
- How does the situated yet global nature of these networks influence their theories of change and experience of societal transformation?
- How do scientific theories interact with dominant societal narratives of change and with the initiatives' theories?
- What is the role of individual agents in processes of societal transformation?
- What is the meaning of individual and collective agency and their relationship to empowerment in these processes?
- If agency is a relational process, what factors need to be in place to promote relationships that lead to empowerment and a feeling of collective agency?
- How do processes of human needs for coherence and stability play out within initiatives and networks and what effects do they have for societal transformation efforts?
- How do theories of change influence agents' personal and collective identities?

Participants in the Second “Pressure Cooker" Symposium: Theories of Change in Sustainability Transitions

II. Towards a European socio-ecological transition.

Domenico Rossetti di Valdalbero, PhD, DG Research and Innovation.

Pathways towards a European socio-ecological transition need to consider the unsustainable current trends existing in the European and global context, that include inequality, a weak multilateral system, systemic economic risks, climate change and the governance gap. Global risks increase inequalities and humanitarian crises of different types. Evidence of unsustainable trends can be perceived in the European Union, where 14 million people from 15 to 29 years old are not employed, nor are they in education or training *"the term NEETS means Not in Employment, Education or Training"*. ***These days we have dramatic evidence of a humanitarian crisis "that involves Europe, when almost 59 million people have been forcibly displaced".*** The emerging awareness and consciousness contrast with the fact that the role of European Union as a key actor is getting smaller, paraphrasing Gonzales' Report Europe 2030 ***"Europe is at a crossroads, either we keep and strengthen the role as one of the main global actors, or we become an increasingly irrelevant outgrowth on the Asian continent"***. Future scenarios should also consider evolving regimes, from state capitalism to global governance of sustainable civilizations.

Environmental issues -as climate change or urban sprawl- are also related to energy sufficiency and the use of renewable resources: ***"the European Union energy bill amounted to 300 Billion in 2014, and the EU is covering 55% of its energy needs through imports"***. Urban sprawl is a good example of inefficiency both in terms of energy consumption and social cohesion because modern urban development neglects community relations and social bonds: ***"social links are lost. In suburbs there is no piazza and the piazza is a social place***

for sharing and change". Energy, environment, transport and land use integrate a complex urban system that requires a fruitful collaboration among sectors and policies that still remain compartmentalized despite the unsustainable trends in European society. For example, in the last decade, "small" consumers (in the domains of household and private transport) have increased their energy consumption rates more than industry while at the same time investing more resources and time in food or information technologies.

The basis for reflection is that much effort has to go into promoting human and social values and support sustainable behaviours and lifestyles, *"which means that we need to educate people to discriminate between what is important and what is not"*. **Individual empowerment, collaborative sharing economy and team-work are emerging concepts that need to be taken on board**. The European Union has set large targets on economies of scope (platforms allowing savings and profits) and economies of network (finance, media, politics, philanthropy), that may represent innovation in a broad sense, ***"a change from Proprietas to Usus that focuses on less ownership and more access.". This can be achieved*** through social and technological innovations as well as knowledge co-creation, which might mean a process of democratization of power. In the end the discourse of socio-technical transitions entails a choice and an ethical dilemma of "the m*an as a shark or the man as a gardener of the planet"*.

Open discussion. Researchers point out that there seems to be an important part of our society who seems to be comfortable with the current situation, and who does not care about social and environmental issues. What happens with people/society that do not want to be sustainable? A new form of social moral/concern is required? Are politicians worried about that? The role of policy-makers and European Union leading sustainable transitions has been discussed. In this sense, despite the fact that Europe´s role might be shrinking, the EU is playing a very important role as a global leader of low carbon policies (Kyoto Protocol). Hence, the EU is still a relevant global actor and has the potential to even increase its leadership role by decidedly taking on a sustainable economic agenda.

III. Sustainable lifestyles and a green economy: the GLAMURS project (short overview).

Ricardo García Mira, University of A Coruña

GLAMURS Project approaches the complex interactions among economic, social, cultural, political and technological factors that influence sustainable lifestyles and transformations toward a green economy. The main research questions focus on the factors that influence sustainable lifestyles like time-use (and time pressure), rebound effects, the feasibility of environmental sustainable growth or tipping points/thresholds. The project integrates the (psychological and economic) theoretical development on the complex relationships between determinants of lifestyles and lifestyle change, quantifying relationships, developing and testing models of transition through empirical research and simulation approaches – micro- and macro-economic models and Agent Based Modelling. The empirical studies -conducted in seven European regions- focused on alternative sustainable lifestyle initiatives and systems of consumption-production. GLAMURS will test alternative lifestyles trajectories and systems of production and consumption for macro-economic effects in order to elaborate robust recommendations for upscaling. This leads to generate stakeholder-informed combinations of lifestyle choices on six dimensions: Work-leisure balance and leisure options, Status of home -fabric and conditions-, Energy use in homes, Mobility, Nutrition, Consumption of manufactured products; all of them are being assessed for environmental impact in the regions under study.

The discussion with the participants in the Pressure Cooker centred on the relevance of studying the spill over effects (e.g. in terms of income and time-use) which measurement has been approached through a questionnaire -that includes variable control- or, recently, using Agent-Base Modelling and simulation. **Ricardo García Mira** agrees that, due to the regression models analysis showed low variance and correlations, the spill over effect should be tested using social simulation modelling techniques.

IV. Theories of change in sustainability transitions: the role of individual and collective agency.

Adina Dumitru & Ricardo-García Mira, University of A Coruña.

GLAMURS analyses the relevance of the role of individual and collective agency in sustainability transitions, being a core ingredient of positive social change. Psychological approaches have defined agency as "*the people´s ability to act on goals that matter to them" (Sen, 1985)*, or "*the active involvement in shaping our own destiny, capacity by which we are "producers of experiences and shapers of events" (Bandura, 2000)*. Several dimensions of agency have been considered, like autonomy (Ryan & Deci, 2000), participation (Max-Neef, 1991), the practical reason and control over one´s environment (Nussbaum, 2000), freedom of choice and action (Narayan et al., 2004), "being an active subject" (Galtung, 1969) or a component of "wellbeing" (Diener & Suh, 2000). Psychological understandings consider agency as an affective, embodied and relational processing of human experience (Frie, 2008) that might enhance certain types of contexts (wellbeing) and relationships (power). Studying agency phenomena from a psychological perspective, some questions arose: *What processes come into play for certain groups to develop a feeling of collective agency? In this sense, in what extent groups and identities are relevant (social identity theory/social comparison), as well as individuals, as active agents that generate spaces for themselves?*

The scientific literature differences between predictable irrationality and unpredictable irrationality (Paolo Zeppini) and also the relation to scarcity, "so poverty of all kinds reduces imagination and the ability to shape one´s life". It was also mentioned the idea of utility as autonomy, relatedness, competence (Ryan & Deci, 2000) and self-determination. At this point, GLAMURS focuses on patterns of time-use as useful frames for studying the relationship between agency and structure in a relational approach.

In the discussion, participants approached the positive and negative implications of agency processes. In this sense, agency is not necessarily positive, hence, in some cases. According to **Adina Dumitru**, agency can also involve certain "resistance to change". Regarding this, different forms of resistance in transition literature are considered. Concerning the topic about how lifestyles can be quantified, Dumitru mentioned that it implies to consider both individual and regional level of analysis, looking at sustainable initiatives. Related to this point and the degree of agency that can resist, the idea of system classification theory emerged. Ideas on the difficult of transition assessment emerged based on the idea that many people make transitions every day.

V. Time Use, Energy Consumption and Lifestyle Changes.

Malik Çürük & Sjak Smulders, University of Tilburg.

Considering the significant impact of household behaviours and consumption choices on environmental sustainability (*for instance, it is possible to save twenty percent of household direct emissions maintaining household well-being only targeting household behaviour*) GLAMURS approximates to the possible implications that micro-level interventions related to consumption patterns/lifestyles may have at the macro-economic level and over time. Changes in consumption preferences are able to change the market. At the same time, improvements in energy efficiency leads to rebound and spill over effects -changes in preferences- and, by taking into account responses like these, we can assess the effectiveness of changes in lifestyles in the sense that the static effect of demand shifts can significantly alter the evolution of the economy by changing the direction of technological progress in favour of a sustainable economy.

GLAMURS project proposes a macroeconomic model of time-use and energy consumption of households and their interaction with technology, since both consumption and technology are interrelated in a non-trivial way. The validation of the model basis on the existing long-run aggregate trends -in relative factor prices, time-use and technology-, providing a summary measure for the macro impact of micro-level interventions towards sustainable consumption, in order to be able to evaluate the static effect of demand shifts. This model includes four main building blocks: labour time and a raw material; market work, house-work and leisure; energy and time intensive techniques in house production; and secular increase in the value of time relative to resource prices.

VI. Sustainability journeys: ARTS, TESS and PATHWAYS (short overviews).

Niki Frantzeskaki -Dutch Research Institute for Transitions-,
Anne Holsten -Postdam Institute for Climate Impact Research-,
Joyce Zwartkruis -PBL Netherlands Environmental Assessment Agency-

ARTS Project addresses the contemporary sustainability transitions topic focusing on multi-actor processes that require new governance orientation which entails changing roles and shifts of responsibilities in local-regional context. According to **Niki Frantzeskaki**, ARTS identifies the mechanisms and local governance conditions for accelerating sustainability transitions, developing strategies and instruments to assist their acceleration and assess them with dynamic modelling approaches. Acceleration is conceptualized as *"the transition phase in which there is an increase in the pace of change in three ways -organizing (structures), thinking (cultures) and doing (practices)"*. Regarding the mechanisms that contribute to the acceleration of sustainability transitions in city-regions, the research shows that transition initiatives often scale-up in terms of increasing number of users and of broadening their objectives (mission); however there are limits to growth and upscaling is not always desired by the transition initiatives. Transition initiatives draw inspiration on practices, missions and operations across regions, across cities and within same cities – within and across scales. Finally, Transition initiatives often create partnerships *"within same domain of operation (e.g. sustainable food) rather than across domains, embedding new ways of doing, thinking and organising into city regional governance patterns"*.

Joyce Zwartkruis introduced **PATHWAYS** as a project that explores socio -technical transit
low-carbon societies from an integrated, multi -scale and transd
understanding of factors that lead to the emergence of new technologies, institutions, behaviour and values and

provide useful insights to policy-makers and stakeholders on sustainability transitions. Methodological approaches include the “Integrated Assessment Models” that support the formulation of strategy documents (eg. those for international climate policy). However, IAM considers many aspects (Aggregate analysis of many options, Quantitative, Links targets with action, Evaluation of options, Forward-looking), but also oversimplification, no attention for actors / behaviour, over focus on economics and limited attention to policy implementation.

Transition sciences provide insight into the factors that determine (the success of) a transition and put attention to multiple actors, analysis of institutions/rules and to dynamics of change (interests). On the other hand, transition science are limitated by (descriptive) generalisation, forward looking/targets and policy advice often on complexity. Finally, Action-oriented research in case studies takes behaviour and motivation as starting point, implying closeness to real-world complexity which allows experimentation, relevance to stakeholders and concrete implementation; but also short-term orientation, limited link to wider context, difficult to generalisate.

TESS Project -presented by **Anne Holsten-** aim to measuring environmental impacts of low-carbon community-based initiatives, analysing success factors for rescaling initiatives, and identifying policy environments particularly supportive for initiatives. The framework developed based on the Project Protocol for Carbon Accounting (WRI 2005) and case-studies focussed on analyzing success factors and constrains for transition trajectories of community-based initiatives over time, evaluating the societal, social, attitudinal, and behavioral transformation processes involved. TESS analyzes how institutional arrangements and change influence socio-technical systems aiming at transition, while enhancing prosperity, wellbeing and equity as well as how the initiatives impact on the respective sectors – both negatively and positively. Regarding the emission reduction, the aim is quantifying emission reduction potential of relevant activities of initiatives in different domains (transport, waste, food, energy).

VII. Accelerating sustainability transitions: A comparative analysis of evidence from four city-regions.

M. Egerman, F. Ehnert, N. Frantzeskaki, F. Kern -Leibniz Institute of Ecological Urban and Regional Development, Dutch Research Institute for Transitions, & University of Sussex – SPRU-

ARTS Project investigates the mechanisms and strategies that contribute to the acceleration of sustainability transitions in city-regions. Three main questions oriented the case-studies research: *what changes? Who changes? How changes?* Local transition initiatives have different characteristics (size, domains, actors, areas of governance and context) but they emerge and act within specific city-regional governance patterns, implying the addition of a spatial dimension, and also being embedded in a multi-level governance context -national, transnational and European. ARTS studies transition dynamics that -potentially- contribute to acceleration such us ***upscaling (***of a single Local Transition Initiative), ***replicating*** (the new ways of doing-organising-thinking), ***coupling,*** embedding (of doing-organising-thinking in governance patterns), and ***instrumentalising*** of governance context. As an embedded multiple-case design, the methodological approach considered the transition initiative as the unit of analysis, the city-region as the case, and the governance context as the context. The project analyses five European local case studies (Brighton-UK, Budapest-Hungary, Dresden-Germany, Genk-Belgium, Stockholm-Sweden) based on qualitative analysis (semi-structured interviews per local transition initiative and additional interviews with "helicopter people" and participant observation).

Preliminary empirical results demonstrate evidences of upscaling processes in all regions studied, with relevant differences across domains, motivations and goals, which creates (internal) tensions depending on resources and increasing visibility. Replicating is also present in all regions in different degrees, there is much more inwards replication than inner replication, and *"transitioneurs"* and *"network initiatives"* at different levels hold a key role. Existence of a great variety of ways of coupling (practical/strategic, enduring/temporal…), but rather within domains and within sectors than across -although with exceptions-, and related to "network initiatives" and *"transitioneurs"* tensions with core activities emerge. Regarding embedding, there is not an universally shared goal and being different is like an important motivation; in this context arises the system versus novelty, or the compartmentalisation versus cross-cutting issues, or the "stretch and transform" versus "fit and conform"; embedding often with informal character seems fragile. Instrumentalising is in place, but differs across regions; being European Union perceived as bureaucratic, but neutral and domain dependence; tension emerges derived from the dependence on external funding versus autonomy of the transition initiative, there is a tendency to "projectification", being local transition initiatives "instrumentalised" by the context.

As preliminary conclusions **Markus Egerman poses that**, ***"different dynamics and mechanisms interrelate one another (more than in isolated niches), in the sense that upscaling can lead to replication -e.g. groups divide-; coupling for the purpose of upscaling, embedding and instrumentalising; and instrumentalising as breeding ground for embedding"***. Despite the evidences of acceleration, a kind of cause-effect relation is not clear by the moment; local transition initiatives are necessary, but maybe not sufficient.

Discussants Input

Tim O´Riordan, University of East Anglia (UK)

Tony Craig, James Hutton Institute (UK)

Heleen de Coninck, Radboud University (NL)

Richard Stedman, Cornell University (USA)

Tim O' Riordan focussed his contribution on the topic of technology, time-use and leisure time and human resistance. A question that emerges is whether social innovation and social transitions have to scaling up but replicating. *"Observing the way people is using technology and how changes the consumption of television, Internet, Social Media, habits and behaviours are changing so fast and researchers have to look at these new trends"*. Social media can be used as positive transformation element that mobilizes young people in energy conservation, for example.

It was also remarked the existence of a "silent disappearance", that is, people are not protesting, they are just disappearing. Reaction is about rebounding sustainability. It was pointed out the relevance of becoming a "change agent" oneself instead of looking at others being change agents: *"never underestimate the effect of pride in persuasion strategies to sustainable behaviour"*. O' Riordan highlights the political angle of the research. In this sense, "University is also a relevant part of social change" in the sense that through teaching and engaging student community in sustainability transitions, we can enhance pro-environmental behaviour, becoming change agents.

In response to O' Riordan proposals, **Malik Çürük** argues that preferences and individual choices can shift -despite the automatic behaviour- if we provide more information about environmental cost of consumption. Besides, income and energy use is an unbreakable linkage. An increase in income causes an increase in energy consumption so technology should provide innovative low energy consumption services and products.

Tony Craig focussed his contribution on ARTS project, wondering the role that individual agency have in the analysis presented by Egerman and Frantzeskaki. From a psychological approach some questions arise regarding how much agency is at heart of the project, so that, local/regional analysis can sometimes forget the individual role in sustainability transitions. Moreover, time-use and time-pressure are two conditions or factors that may be taken into consideration: *"What are the implications of time-use perspectives?"* Craig also addresses the question of the selection protocol of case-studies in the sense that the way we select the local initiatives will determine the way to compare them: *"we tend to compare them if they are similar, but that is determined by protocol"*.

Heleen de Coninck focussed her contribution on the question of how experiments are leading to change and whether experiments can lead to transformative change. De Coninck wonders *"to what extent we are investigating isolating experiments. Are they really transition experiments?"* Regarding ARTS project, some critical points emerge with regard to the transition dynamics and mechanisms studied in the sense that *"it appears that rather investigating a reality we are testing or confirming those mechanisms? Who is changing and who is not changing in an initiative?"* for instance, if we look at a food initiative, are practitioners changing their lifestyles or just one side of their lives? Is the person involved in a food initiative also active in other initiatives? Research might face also some of these questions as well as look for dependencies between factors.

Richard Stedman focussed his contribution on the sense of place and agency in sustainability transitions noting that Transition studies are starting to focus on agency phenomena in their recent approaches. Previous interventions also mentioned the negative or positive effect of agency. System changes are based on our perceptions and associated behaviour. Regarding subjective agency, we behave according to the interpretation and meaning that we give to things that we pay attention and then we interpret those perceptions. The role of power and the disproportionate power was also pointed out so, we need to understand variability within context as well.

The concept of attachment - between oneself and the place- was also mentioned, in relation to affinity. Behaviour engages descriptive meanings and attributions in the sense that different actors assign different meanings for a setting, e.g. a given place has particular set of meaning, we can be attached to a place and have different relations with it and, at the same time, we can be attached to very diverse types of places. Agency and subjectivity should be considered. Community and identity are not the same mechanism, while community requires social interaction; attachment can be strong even if no social relation exists so that people can be attached to a place without social relation with the area.

VIII. Innovation journeys. A diversity of discourses of change, labour culture, learning processes and conflict.

Alex Haxeltine, University of East Anglia
Flor Avelino, Dutch Research Institute for Transitions

TRANSIT project aims to explain how social innovations can lead to societal changes and address broad challenges. Within this frame, TRANSIT works in building a theory of transformative social innovation approaching a multilevel perspective and fostering the co-production of knowledge engaging academics, practitioners and stakeholders. The empirical research analyses twenty social innovation networks across Europe, Brazil and Argentina. Several qualitative analysis methods – as discourse analysis of narratives of change- have been used in TRANSIT to study similarities and differences among transnational networks and their local manifestations and how they relate to each other. Social innovations elaborate some narratives of change: "*Why the world has to change? Who/which actors have the power to do that? How, when and where change can be done?*" **Avelino and Haxeltine** confirm with several examples that narratives are good objects of study in sustainability transitions. Despite the huge differences existing among the initiatives studied, these initiatives pay considerable attention to the production of trans-local narratives and are aware of the 'structural power' of the role of narratives in enabling or either impeding change. Avelino wonders whether the study of the narratives of change could increase the narrative skills or helping their narrative agency for the initiatives to increase their potential and reaching more people. That would be a challenge for the researchers.

IX. Culture reengineering in view of promoting sustainable innovation: Reflections based on the future of work and EU-Innovate accumulated experience

Simon Dolan, ESADE Business & Law School.

EU Innovate is a project funded by the 7th EU Framework Programme which explores the possibilities for rethinking consumption and production systems as part of a transition to low-carbon economy by 2050 focusing on the creative, innovative and entrepreneurial roles of users in developing novel sustainable products, services and systems, gathering nearly 40 cases. The European Research Review has been the dissemination tool in order to reach academic and not-academic community. EU-Innovate approaches people's position in society as users and how that would change the transition to sustainability. Dolan explained the three basic drivers of change that would lead users to have more power and that might contribute to the transition to sustainability: ***"Universalization of internet access; Globalization processes and a new supply chain configuration more open to users' demands"***. In this line, Universities must have a relevant role I social change: ***"being a space for stimulation and promoting co-learning and new forms of learning"***.

Work in the future will be constantly changing and efficiency will be reached via automation and effectiveness through talented and motivated collaborators. In order to become an effective change agent, people need tools and narratives: ***"the principal task of a public servant leader in the XXI century would be to manage change(s), to coach and to contribute to the development of an empowered culture: be an agent of culture reengineering"***. The **"empowered culture"** is a new term emerged to define a new desired future scenary, which includes several components and leadership minds. A leader must help to diagnose why each group should change, audit the shared values and to define tools and strategies for doing it. In this line, Dolan places

values in a central role, as being the DNA of our behaviour. Three axes of values are identified: “final values, instrumental values and emotional values, together with their interfaces” while fear appears to be the main obstacle to organizational change”. Responding to a question arised from the participants, Dolan referred to the conceptualization of values, in the sense that values do not act in an isolation way but in interaction with other values. studying core values and choices is possible to develop simplified models of behaviour change to provide tools and recommendations to policy-makers.

Researchers referred to the study of “metanarratives” that enables to observe clusters and ways by which the different initiatives are connected among them (such us TRANSIT project, that propose four clusters). Intentions and expectations among networks -when they participate in a broader community- arise from the case-studies discourses. Several intentions have been identified regarding the way that the local initiatives integrate some common points and values within their networks while they have developed their own worldviews and local values.

X. Agency and Transitions: An Agent-Based Social Simulation Perspective.

Tony Craig, The James Hutton Institute

Agent based modelling is a social simulation tool used in GLAMURS to simplify the reality and to represent -with some limitations- individual agency processes. Craig presented the Scottish GLAMURS case-study that involves two “flexible working” initiatives lead by the Aberdeen regional authorities in Scotland. This case study approaches a regional perspective (Aberdeeen Shire, that count with 45.000 public servants) and regional initiative is based on a simple idea: *“utilise workplaces that are closer where people live and that are not used when work occurs, like public libraries”*. This idea involves several challenges related to the “micro-territory of office environment” that workers might miss, the phenomena of “hot desking”, existing individual differences and preferences or “where to work” when the new office is full. The investigation aims to tested -through focus groups- the potential to upscale “flexible working” initiatives like remote working hubs. Security showed up to be the biggest barrier. Secondly, from a sustainable point of view, working home implies that energy consumption would be distributed around the region. Besides, a range of organizational issues would have to be

managed because of the importance revealed of knowing where your colleagues are to work efficiently.

In Agent-Based Social Simulations, agency is represented as the ascription of a process to a simulated entity but does not explicitly represent the four conditions for human agency defined by Bandura (2001), so the doubt emerges on whether can be said or not an agent of a computer simulated model to have agency. Craig enumerates Bandura's agency elements: intentionality, forethought, self-reactiveness; self-reflectiveness. Craig wonders which those conditions are necessary and sufficient conditions for agency.

Questions and discussions with the participants focused on self-reflectiveness (one of the agency attributes suggested by Bandura) and their difficult representation in computer models. It has been pointed out that the question on whether an agent from an agent based model can be argued to have agency is more a theoretical and even philosophical one. The importance of answering the doubt is being sure of what we are building with the model. Models are better to represent how change works in a concrete context so that the problematic unit is the individual. Agent based modelling is specifically tailored to represent much higher level relationships between entities. Self-reflectiveness can be represented in an attitude scale and modelled; however representing the dynamic of the agent model may be problematic. For example, the software may be useful to do reasonable assumptions on how humans would start to behave at the baseline of the model but there is no empirical evidence to prove the next steps within the model, unless you have all the empirical data: "*Actually, models are always simplifications of reality but can provide relevant information. We need to be more confident and validate them as much as possible with data*". Relations of the model can be validated or reformulated based on results from questionnaires but finally all the complexity of reality cannot be measure: "*Models are fictions, a way of represent a reality, telling a story about how we think the reality*".

Discussants inputs:

Liz Dinnie, James Hutton Institute
Giovanni Caiati, Laboratory for Citizen Science
Walter Wehrmeyer, University of Surrey
Niki Frantzeskaki, DRIFT
Georg Holtz, Wuppertal Institute
Gil Penha Lopez, University of Lisbon

Liz Dinnie centred their contribution on narratives of change on Transformative Social Innovation and applauded the research objective of understanding how different networks put forward and conceive narratives as well as the existing differences among them: ***"social innovations are more than meaning-makers, they also work as instructors on how these initiatives would like to see the world and its changes. They are not neutral"***. Those initiatives construct narratives of change – so far so good – about what has to change, why, who will do this and how are trying to persuade people on the truthfulness of its point of view. Narratives of change enable the comprehension of how social initiatives confront power and authority and deal with dominant and institutionalised systems of knowledge and power. Moreover, despite social innovation underpins transformation, a clear definition of what is understood by 'transformation' is missed. ***While by looking at social innovation initiatives we can look at transformational change, is there an element of tautology here?*** A puzzling point was trying to see how they fit not along each other but how they deal with the existing narratives: ***In what extent do they challenge dominant discourses existing in the world?*** This analysis brings to power of different groups and comparative influence those narratives have. Also is interesting to understand the level of the networks and how narratives (ideas) become translated into actions and material resources and observing ***"how people return to ideas to justify their behaviour and social practices in a broad sense".***

Giovanni Caiati remarked the distinction between social innovation and social change pointing out ***"the link between narratives, power exercise and change in power. Adding technology to this pairing could be an added value for the analysis of change"***. Narratives are a powerful way of synchronization of people and issues in a concrete social context that could be combined to a single frame and complemented with other study objects as emerging leaderships, emerging myths and symbols. ***"Synchronization linked to the use of art, participatory approaches and communication strategies can be understood as expressions of a given narrative"***. The analysis of narratives could be also be complemented with the counter narratives, studying how "the other side" discuss the "alternatives of change" and observing related dissonance processes.

Walter Wehrmeyer analysed the paper related to "culture reengineering in view of promoting sustainable innovation" and wonders why we should be worried about the future *"life is meaning and is to be supported by work but first priority has to be the meaning"*. Regarding the technological trends described in the paper (globalization, virtualization and changes in the production chain) as determinants of the future of work; implicit in the argument is the notion that *"technology drives technology"*. Such processes of social change and homogenization would lead to enormous processes of fragmentation of cultural values together with the disappearance of social identities. Future is presented as a complex system that feeds on itself because society changes itself. Future visions based only on the technological driven change -not social driven changes- are built with no meanings. The question that arises is *"if we should build a sustainable society as an ethical need. Without this, the future world would have no meaning"*.

Niki Frantzeskaki reflects about the scope of the research of the EU-Innovate project in the sense that users/consumers are active in defining or even co-defining how we use and produce technologies and innovations overall. However, the paper provides inputs only for the landscape changes (e.g. digitalization) and recommendations relate to future managers and CEOs, but not to employees and how they can be prepared for the new working space and conditions: *"It is paradoxical affirming the user has a role to lead change in society and work but the recommendations given are only intended for executives"*. In this sense, it would be interesting to know recommendations that we can provide from this framework and analysis to future employees and to the future working place seekers so on. At the same time, in the paper there is an implicit consideration that users and workers are at the passenger seat of global developments which *"could be seen as contradictory with the communicated scope of the EU-Innovate project as also presented during the workshop. It will be very valuable to see how early findings from the research reflect upon the initial working hypotheses of the research project/design"*.

The agent-based social simulation has been analysed by **Georg Holtz** who wonders *"if agents in agent-based models can be said to have agency or assuming humans have agency, do we miss something important in ABMs if agents don't have agency?'* This question also relates back to how complex a model should be. Models are always simplifications. Some models that come close to capturing some aspects of agency may exist at the advanced edge of artificial intelligence, but are quite remote from the type of agent-based models build for 3-years EU projects having a limited amount of resources. While it is agreed that agents do not have agency, they never can be creative to the same extent as humans and they are restricted to react to particular elements of the world that are included in the model. *"We miss something important when building models depends on the research question and model purpose. What is the model designed for and is the representation of human behaviour sufficient for that objective?"*

ABMs are useful to put together a set of knowledge and assumptions for understanding their interactions and the dynamics that arise from those interactions. The human mind is not very good to 'compute' dynamics of complex systems, and computers help to do so. The target 'equilibrium' of a transition is not 'out there' when the transition starts. Complex systems theory and socio-ecological systems research (e.g. the Panarchy book) talk of 'stable attractors' instead of equilibria. Various such stable attractors may exist based on some fundamental aspects of the wider system in which the transition unfolds. Furthermore, pathways can be argued to be shaped and even created during the transition by the dynamics of the transition itself. An interesting perspective for studying transitions therefore is: are attractors out there in the beginning of a transition, and what constitutes them? What/who selects attractors, what are general constraints against which attractors can be formed? Some selection between alternative pathways may be rooted in collectives; some decisions may be made by key actors (e.g., formal regulations, infrastructure). The question of attractors is in particular interesting regarding social innovation, i.e., is the future completely open for any social innovation? If not so, what does constraint it? In principle, ABM is well equipped to represent life-style changes assuming a 'flat ontology"of actor networks and emergence. However relations of power, of key actors, the co-evolution of technology and behaviour, regulations, availability of infrastructure, might not be well represented in the models while influence people's behaviour and might contribute to life-style changes. Including these things makes life of a modeller far more difficult.

Gil Penha Lopez *considers that "testing the feasibility of an Agent Based Model it would be interesting to talk to decision makers, also framing the environmental context is crucial to adjust it"*. Looking at how global issues like climate change, financial crises and technological development are integrated into the agent based model presented in GLAMURS would be a good exercise of revision. Hence, there are other adjustments to be made regarding the microenvironment level *"when we talk about Transition Towns, Ecovillages, Impact Hubs or similar people there try to change things, values and practices there but there are spill overs also with their behaviour at other spaces like home or work"*. Climate Change research always design future scenarios on what could happen. Another technique is going the other way round; set a vision and then study different pathways on how to reach that particular vision so the ABM could do the same: *"setting a vision and then back cast on what agency is needed to happen at different levels for one vision to become real"*.

XI. Relational, temporal and spacial frames for agency theoretical development (small group discussions).

Small discussions outputs related to the differences among types of agency and its outcomes (relational, temporal and space) that seem to be "not very useful". **Agency is situational and time embedded**. A condition for agency to emerge is that the context is understandable, castes and something people care about. Contextual competence of people could be defined as the wanting to be effective, wanting to understand a particular situation being an effective actor within this situation. This contextual competence depends on the nature of the setting; the nature of the individual and the interaction between both. **Agency has many different meanings depending on the disciplines**. Five different types of meanings are identified within the social sciences domains: Social consequences (both unintended and intended); Ascription (actors can be ascribed to the ability to do something); Power, Freedom and Autonomy; the ability of actors to reflect and transform things; Reflection, self-understanding and interpretation and reinforcing versus transforming structures.

Agency is always relational. An interesting question is to what extent an additional form of agency emerges when a group comes together -a sort of emergent collective agency- and, if so, what sorts of 'coming together' facilitate this. The answer would be affirmative depending on the social context and power relationships. On the other hand, individual and/or societal agency (then relational) depend on the moment of time you are capturing it, so it is interesting to capture the across time development and looking at multiple units and dynamics -manifestations of change within the systems- and looking at how system changes.

Individual capacity is linked to the capacity of building alliances but the role of Transformative Sciences shouldn't be "telling people that they alone can build power and transform things". Our Science should be dedicated to develop methodologies, procedures and processes through which people can develop these individual capacities to build alliances and collective empowerment. Switch our research engines to break the gap between solid structures and individual agency, based on our knowledge of the processes of change already happening. The world of normality is not really sustained. Are we connecting to the different levels or spaces where people work on generating ideas of new thinking on democracy, entrepreneurship, governance, economies? We must go beyond alliances for reaching different scales of transformation.

XII. Bridging integrated assessment modelling, the multi-level perspective and initiative-based learning: Lessons from the Dutch land-use domain.

Holger Berg, Wuppertal Institute for Climate, Environment and Energy (Germany).

PATHWAYS Project aims to analyse sustainability transitions from 3 different angles: Quantitative systems modelling; Socio-technical analysis and Initiative based learning and then to merge the findings. Languages methods and ideas from these approaches used were found to be very different. PATHWAYS´ Socio Technical Analysis have already been performed and applied to the Netherlands land-use domain. The idea is to analyse sustainability transitions in different ways using the units of context or landscape; regime-which includes nature regime and agriculture regime- and niche innovations one and trying to depict future constellations of more sustainable regimes. *"Results offer more lock-ins but few possibilities for breaking the direction in the Multi-level perspectives analysis than in the modelling so the results of the last are more optimistic on the potential transition to sustainability"*. Besides *"when we analyse those initiatives, findings show that much of the innovations come from new entrepreneurs"*.

XIII. Revolution or evolution: What happened to conflict in sustainability transitions?

Lizz Dinnie, James Hutton Institute.

The results obtained in the TESS project show that the number of sustainable initiatives is growing up and they are beginning to detect systematic patterns. One common characteristic within these initiatives is that all of them engage in prefigurative practices. A second pattern is that they offer positive response models organised normally around the same themes: re-localization of production, transport and energy to a smaller geographical scale; energy descent and reducing carbon footprint. Besides, transition initiatives do not necessarily engage in prefigurative practices but there are other ways used to respond to climate change like direct action, protest and others. The question behind the analysis of their practices in TESS would be if these local practices achieve or contribute to large scale systemic change: *"the consensus model of the transition groups leads them to define themselves as apolitical and we need to think what has happened to politics, to confrontation through local action, how do they challenge large-scale political power and big businesses"*. According to Dinnie, the change that they promote in general not only refers to environment: *"it is more holistic, one has to do with creating a new way of living"*.

Regarding external governance and relations, *"often transition initiates propose bottom-up activities, but they do also have to engage with governments, funding schemes and in general they reject the need of having to engage completely with wider political structures"*. Dinnie highlights the disjunctive of this groups able to challenge those power structures or if they are in risk of being coopted. How these groups grow: Scaling up or replicating? How does it take count of changes in everyday practices? In this sense, comments from the public referred to the ambition of those initiatives to reach "a social transformation" which depends on the way that the social movements and the culture have developed in a certain region *"initiatives change and go through waves, the fact that some initiatives disappear in short periods of time and that individual participants are usually involved in several initiatives are evidences of the fragility of some initiatives"*.

Discussants inputs:

Alex Haxeltine, University of East Anglia

Anne Holsten, Postdam Institute for Climate Impact Research

Flor Avelino, DRIFT

Richard Stedman, Cornell University

Alex Haxeltine commented the lessons from PATHWAYS Project and results from Dutch land-use case-study focusing on reflexivity and agent base-modelling: *"there is a basic assumption that integrative assessment model can offer a rational picture of the state of the world codifying it in a Computer Simulation Model and provide information about the required society model. But it has been proved that in between the equations there is a whole world view and need a deeper definition"*. Haxeltine wonders if explicit or implicit theories of change and worldviews have been integrated in the scheme and how researchers confront competing visions of the same thing, with these different ontologies "the trend is that we are making a switch from thinking that we can inform local initiatives to engaging them and interacting with them in knowledge co-production processes. To put the deeper assumptions of their theories of change into a dialogue and also to set up a dialogue within the initiatives themselves seems to be challenging for transition researchers.

Anne Holsten remarks the high density populated area as one of the interesting aspects of the regional case study presented by Holger Berg in the sense that "it is important to be *clear to which place or sector actually need to shift to be sustainable*". Feeding results from this multilevel perspective and then to the agent model and then the initiatives would make the project more exciting: *"all the linkages you have found among the three approaches could have been made without the case study?"*

Flor Avelino analyses Dinnies´work and starts questioning the extent to which extent these local actions are made out to be post political *"they often define themselves as post-political and apolitical but the previous question to be answered is what political means and going beyond the narrow definitions of party politics"*. The initiatives studied leave small role for technology which is completely different from ecovillages and related to low carbon initiatives under study in TRANSIT and might have to do with the selection criteria. Transition initiatives term is used in the paper to refer to transition town initiatives and ARTS uses the same to refer to initiatives that argue that a transition is needed. There is confusion inside the Social Science Academia regarding the use of terms like "grassroots", "civil society", "social innovation" or third sector. Avelino proposes that *"as a group we could define certain common dimensions of these terms to avoid confusion"*.

Richard Stedman considers the idea of local action as challenging larger scale political power. In this communities consensus may not be a realistic goal and focusing on consensus approach can limit the scope and change the process of what might be accomplished. Stedman formulates a number of "basic questions" concerning Dinnie´s paper: Are these communities doing conscious efforts to be part of a potential larger community? How this may change their practices? Are we also part of something larger that may allow us to learn from each other? Stedman recommends thinking about variability and who are the community actors shaping the priorities inside their own projects. Also, conducting Interviews and data analysis on how participants consider they are doing their roles in terms of outputs is really interesting. In this way evidence of change can be measured.

New proposals and questions were also formulated by the attendees related to the evolution rate of social innovations *"Initiatives are evolving much faster than the research about them"*. For example, *"ECOLISE is linking with universities, creating their own research networks and asking how could do science being beneficial for them"*. Many times initiatives justify the way they do things just because it is fun and they try to change their way of living. They are detaching from the rationality paradigms and this must be taken into account. Understanding the transition to sustainability and how the world is changing is just our first duty but we all need to contribute to sustainability and promote it through our works "*We still have an ethical duty to what is positive and constructive engagement within the sustainability agenda"*.

XIV. Biodiversity and energy transitions: BIOMOT, SIMWOOD, MILESECURE (Brief overviews)

Marino Bonaiuto, Sapienza University of Rome (Italy),
Fátima Cruz, University of Valladolid (Spain) &
Giovanni Caiati, Laboratory of Citizenship Sciences (Italy).

Marino Bonaiuto presented an overview of the BIOMOT FP7-ENV 2011-Collaborative Project, focused on the "Motivational strength of ecosystem services and alternative ways to express the value of biodiversity". Considering that a healthy biodiversity provides a number of natural services and benefits, social concern regarding the degradation of the biodiversity have increased in the latest years *(including the Pope Francis, that recently address the biodiversity issue in his recent Encyclical letter)*. Biomot aims to establish (theoretically and empirically) which biodiversity values motivate and activate people (especially leaders, "superheroes") to outstanding pro-biodiversity actions at the local, national and European levels. The methodology selected for case-studies (210 cases in 7 European countries) combines qualitative analysis of "Life Histories" and quantitative questionnaires. Bonaiuto presents preliminary results of the study; highlighting the existing trend between childhood experiences (values) and future commitment in nature protection. Parents, other relatives or even teachers influence people´s perception about natures as well as significant "very strong" experiences (positive or negative) recalled by people concerned with the environment, also called ***"Environmental Epiphanies Experiences".*** The questions arising from the public focused on the political recommendations that might emerge from the results of Biomot project. In this sense, more creative ways of tackle pro-environmental motivations with young people are required, taking into consideration the technologies and new ways of communication (social media, Internet) as well as enabling young people to have direct experiences with nature, e.g., formal and informal activities in contact with nature (more information: ***www.biomotivation.eu*).**

Fatima Cruz presented the SIMWOOD project as a four-year EU FP7-KBBE collaborative project which aims to promote local -sustainable- development with forest resources. Simwood started in 2013 and includes 28 partners from 11 European countries. University of Valladolid participates in this project with a **multidisciplinary research-team that gathers technical and social scientist experts in forest management.**

The background of the forest resources exploitation is characterized by large forest resources but small areas, different owners, different conflicts and users that compromises the management of forestall areas "the project reaches out to stakeholders and regional initiatives with the aim of 'waking up' and mobilizing forest owners, promoting collaborative forest management and ensuring sustainable forest functions" becoming an open space for public participation. Simwood creates "learning labs", it is said, social laboratories to put together stakeholders and land proprietaries, policy-makers, and people with different profiles in order to identify common problems, find solutions and improve local development.

The participants in the Pressure Cooker were interested in the participatory methodologies used by the researchers in the two case-studies selected in Spain. Mrs Cruz explains that the researchers select different techniques according to the territory. However, focus groups, interviews and participatory interactions are common methods, taking into consideration that they are leading an action-research study. The learning lab seems to be an extraordinary useful tool (following the urban-learning lab approach), engaging planers and citizens, local stakeholders, regional and local policy-makers, and starting and open discussion about how to design the future in rural areas. Several risks are taken into consideration in this work but fires seem not to be a big issue because all the initiatives studied (in Spain) have a long tradition in forest management and fires are not common there, however, European colleagues certainly should deal with this environment risk.

Giovanni Caiati described MILESECURE-2050 as a project oriented to comprehend and overcome the political, economic and behavioural traits and trends that difficult the implementation of low-carbon policies in Europe and guarantee European energy security in the horizon 2050. The project study the energy policies, trends and existing scenarios, analyses anticipatory experiences on energy transition (at the local level) singularizing societal processes for energy transition. The main expected outcomes of the project relate to the elaboration of scenarios and modelling approach (combining local and global, multidisciplinary approaches) and, secondly, the elaboration of policy guidelines and the drafting of a "Manifesto for the Energy Transition". Being asked about challenges, Caiati affirms that the challenge of the project is to generate innovative models, based on qualitative and quantitative information, obtained from the analysis of participatory experiences put into the model.

XV. What is the role of human factor in energy system change?

Giovanni Caiati, Laboratory of Citizenship Sciences (Italy).

Following the general framework presented above, Caiati remarks that MILESECURE project aims to study the future from the empirical observation of "anticipatory experiences", it is said, local experiences that are really developing new ways of consuming and producing energy resources. In this sense, the anticipations provide indicators of the key social dynamics that may characterize (future) energy transitions. The project analyses 90 (local) projects in 19 European countries that try to confront several problems regarding energy transition so that there is no consensus about what is the most effective way to achieve a low-carbon society. Most of the socio-technological approaches tend to consider citizenship as mere receptors, not an agent of change, but this project focuses on the rising of the human factor, from a peripheral role to lead the change of energy systems (in Anticipatory Experiences). Energy change involves a general change, a critical attitude towards contemporary society and anticipatory awareness regarding environmental issues. The "Human Energy" approach comprehends Human Energy is a holistic and inclusive understanding, articulated in three dimensions: extrasomatic, social and endosomatic energy dimensions. Each of them relates to three different social functions: localisation function (accessibility); cybernetic function (self-governance) and repositioning function (use of own energy). The Human Energy approach will be used for the identification of social processes lying under

energy transitions and for the identification of one of the three different scenarios produced in the project: the "Social Energy Transition").

Participants in the Pressure Cooker pose several proposals regarding the dimensions of analysis taken into consideration, for example, despite model is based on economical approach, it could include time-use dimension, for example, considering the time-use in mobility and if a change in transport behaviour (possibly) involves an increasing of time-use in commuting (and how people deal with that).

Discussants inputs:

Joyce Zwartkruis, Netherlands Environmental Assessment Agency
Bonno Pel, Universite Libre de Bruxelles

Regarding the presentation of MILESECURE project, some questions and clarifications formulated by **Joyce Zwartkruis** related to the methodology and the meaning of the concept. Zwartkruis wonders how researchers selected the cases from the database and what criteria was used for including or excluding projects: "It seems that the focus on the human factor was a starting point for studying the cases, and your conclusion is that the human factor is important. But isn't that the outcome of the study in case you focus on this element: or in other words aren't we looking for the things we want to find?" Secondly, the discussant focused on the functions that derived from the cases: *"Did you find differences or similarities in the functions among certain types of projects or certain combinations of functions? Did you see clusters or trends?"* The paper affirms that the human factor will turn upside down the energy system in transition, but *to what extent there is enough power to realize this transition? What will be the impact on sustainability?* Regarding the endosomatic energy, it seems it is only a very limited amount of energy, however, *how does that relate to the decreasing amount of spare time people have?*

Bonno Pel focused on the general approach of the project, which basis the study on facts – the anticipatory experiences- and not in hypothesis that seems to be an innovative and attractive proposal that enables to show arising human factor. Pel ask for the selection criteria of these anticipatory experiences and –analysing the initiatives- Pel wonders if human individual positions relate to narratives of change and if those positions are coherent. The dimension of "Human Energy" becomes complicated to explain besides dependency of technological development (except in the case of using bike), people´s mobility seems to be conditioned by technical and external energy resources. *How to deal with that in future scenarios? Does the project develop scenarios that contemplate both bottom-up and top-down situations?* In relation to empowerment, human energy had been, historically, connected with politics and power relations.

Caiati provides some responses to emerging questions. In regards to the "Anticipatory Experiences", these have been analysed using several criteria: 1) initiatives that have obtained significant results in terms of sustainability. 2) Variations between different experiences and different patterns (reposition function, mobility places…). 3) Initiatives that have reduce production and consumption of energy. 4) Not only "educational experiences" they should be real experiences of ecological energy uses, using new sustainable resources, etc. 5) ideological or ethical criteria in order to select experiences oriented to provide wide solutions to several issues (local and multi-dynamic approach). Regarding the position of receptor in human factor, the project hypothesis is based on that the experiences that do not take the human factor into consideration -that involve only technological solutions to energy transitions- will have to confront enormous problems to gain their goals. The use of technologies also motivates the human factor, but in the basis of transitions, social and personal dynamics also matter, citizens

should be “agents of change” (based on a deep change at the personal level) in local transitions. Finally, power relations in energy system are substantially relevant and should be more studied especially linked to formal energy sector. Milesecure project pursue one more democratic energy system. Despite the incapacity to change all –traditional- energy technologies and energy systems, several real experiences show a number of examples of “energy revolutions” enhanced by grassroots innovations.

XVI. “The methods corner”: small group discussion on methodological outcomes, challenges and the role of science in social transitions.

Reports by **Julia Backhouse, Niki Frantzeskaki & Alex Haxeltine.**

The last small-group discussion was focused on the methodological challenges in sustainable transitions research (*succeeds, failures, new methodological proposals, research innovation demands*) and on the role of researchers in transitions towards sustainable societies. Three questions were proposed to be discussed in the small groups:

- Looking at how agency is taken up / studied in the projects: What do you consider a methodological success in your project?
- In an ideal world – e.g. unlimited funding – what would be the types of methods we need?
- Science should be useful for society. What does this mean for what we do? What does this mean for methodology?

Key aspects of discussion emerging from “Group A” (discussion reported by Julia Backhouse)

The group one focuses, in the first part of the discussion in **presenting the methodological success in each project.** In this sense, ARTS uses an implicit agency perspective and studies those who “do the change”, this is different than the MLP perspective in considering people/actors; methods used involve talking to people who do the change and answers are triangulated; although it had not been planned that way, the project now takes a participatory approach because there is much to be gained from participating in those actors’ events; another highlight is the study of dynamics between regions which implies going beyond “niches”. For instance, GLAMURS studies lifestyle changes in an integrated manner, on the micro and the macro level; connecting these levels methodologically is difficult, between the individual, small groups and large contextual influences there is a methodological gap; the approach thus far is combining different social science methods, including survey, focus groups and modelling (prices); the project is most interested in interaction within and across these different levels. Richard Stedman remarks that his research he aspires a great level of precision in measuring concepts that others thought are difficult to measure, e.g. place attachment or place meanings; his approach moved the conversation in science to a new level. In TRANSIT, the project takes a relational perspective and studies changing social relations (or ambitions to change social relations); the role of agency and the empowerment of actors are core themes; methods used are conventional social science methods (archival research, interviews, participant observation) but analysis and presentation of results involves drawing actor and spatial maps, and the project overall includes inductive and deductive reasoning and an iteration of moments of theory development and empirical research. PATHWAYS highlights the number of niches studied, within one domain (food/meat) as well as compare across different niches. In sum: all projects aim to “move beyond the MLP” and use a variety of methods to study a number of “niches” on different scale levels and across different

contexts; a methodological challenge all face is the integration of rich data gathered by a variety of methods

The second part of the discussion focuses on the **types of methods needed by researchers.** In this sense, science miss "experiments", for instance, psychology focuses on experiments, inside and outside of the lab. However, "we are all studying natural situations". Participants concern about how to experiment with economics (such plans may not pass ethics commissions). Change is at the centre of our work, but there is a generic definition of change. How can we define what is changing, measure that change and explain what is causing that change? This question is discussed in the ARTS project: if we know what needs to be accelerated, we knew what to study precisely.

Regarding the role of science, researchers have a good idea of the situation we need to get away from but we have little idea towards what we need to change. Exchange and negotiations between actors about possible futures are needed and this is where science can also contribute. Otherwise, different disciplines need to cooperate and different foci need to be covered. Especially impact factors need to be studied better/in more detail. Data storage and availability is regulated by the EC. However, what open access means for our data is not clear and not enforced. Research data should be made freely available *"our methodology often is not based on or inspired by what the people and the initiatives we study are interested in but rather by what our funders demand. We are positioned between funders and research subjects. Ideally, we would study what "society" is interested in"*.
There needs to be a symmetrical focus on **theories of change** and theories of resistance or stability. Many initiatives we study are "old wine in a new bottle" and not really innovations but actually age-old practices. In practice theory, however, something is considered a new practice if it changes meaning. An example how this also opens a practice to new users (carriers) is hunting for local meat: it used to be a traditional (conservative) pastime but now also (politically) "left" people get involved. The different time frames of politicians, business and civil society actors are often mentioned but understudied. Our theories need to elaborate how these time frames play out in long-term transformations (2-3 generations).

Key aspects of discussion emerging from "Group B" (discussion reported by Alex Haxeltine)

Group B focused on institutions and social practices in developing transition theories: how actors come together and contribute to transitions? We need to pay attention into the way that social achieve sustainability over time (economic crisis) thinking about why agency is constrained in social context, contributing in transition processes and how individuals and collective come together into building transition and agency (have a global awareness). Secondly, we should consider the special qualities, the "colours of agency", in sustainable transitions in transformative change processes. There is a need of breaking free from biases, methodological barriers and rush at the end of the project. Ideal research could imply transnational and/or longitudinal studies as well as methodological flexibility. A difficult link exists between different methods and paradigms in the way of participatory research, to engage scientist into action research. More work to improve alternative and creative thinking about sustainability.

Objectivity/subjectivity dilemmas emerge in the discussion related to the attachment between researchers and observed reality. What different perspectives exist in the reality? Otherwise, the authenticity in communication and trust building processes with practitioners and civil society are required in transition research. As institutions, we need to involve society in the construction of a sustainable work. Change should be faced from very different perspective and frames. A real engagement is necessary from science and universities, which are training students for the future. Universities can be an observer or can be in the ground, becoming "agents of change", creating a better future and a new society. Agency seems to be a key point in these studies: what actors to look at? Initiatives or networks? Locally or globally oriented? These decisions influence our diagnosis of processes. How to do properly research on methodology and how to move forward are emerging questions.

Key aspects of discussion emerging from "Group c" (discussion reported by Niki Frantzeskaki).

The third group highlights -as **succeed experiences in methodological approaches**- to be able to broke free from bias when selecting transition initiatives that communities only work for sustainability (ARTS) as well as embedding psychological/social sciences in computer simulation models (GLAMURS), developing a case-study methodology that allows comparability while allows researchers to choose their methods (data for in-depth case studies) (TRANSIT) and trying to gather data and then analyse in different ways; to connect among different levels; nested analysis; do not stick to one level/layer only (BIOMOT). Focussing on issues that matter practitioners (rather than instrumentalizing from the beginning) and enable open debates with policy-makers from the beginning rather than leaving it at the end of the project (ARTS, GLAMURS) are also remarked by the participants. However, this group also finds **"lowlights"** that should be sort out in next projects: setting a realistic budget; the obsession for co-production and transdisciplinary without make sure that it works in practice. It relates to good method and skills to do transdisciplinary research. Underestimate the time and people investment needed to set preconditions for doing transdisciplinary research (e.g. trust-building). Other aspects of methodological approaches relate to the focus of the european research "only in European world vision despite the global dimension of issues (it is a larger world out there)".

Discussions focused on the connection between research to practice "sometimes underestimating the intellectual talent and curiosity of practitioners". On the other hand, policy relevance and implications (of the projects) for the practice is left at the end of the project and done in a rush. Projects have not enough time to research in depth (e.g. how to observe and measure new relations, agency processes, etc.). When we want to do something for practice, it needs a strategy to instrumentalize it. In regard to the question of how to conduct our future researches in an ideal context, discussants suggested the possibility of conducting a global research, not only in Europe or translocal research projects ("research done by local researchers too"). Developing longitudinal studies and methodological flexibility should be possible; because sometimes we consider that a different method may be better that what it is in the project proposal. ***What is the role of science***? Researchers assert the importance of social science side by to natural science for sustainability. The scientist connects knowledge across space and across time and become reliable sources of information. On the other hand, always exist two sides of the coin (bright and dark side) and sometimes policy-makers and institutions are not happy to listen what researchers have to say. Scientists might have a strong voice in local agenda, providing formulations and discussions, but we doubt how to deal with public expectations.

XVII. Plenary discussion, conclusions and following steps.

The II Pressure Cooker gathered nine European projects funded by nearly 35 M€ which is an enormous investment in responding the question of how to improve social change. It is also a normative question, that have been answered by many people (policy-makers, marketing experts, economist) how can we change communities? We have not found an answer despite 25M€. We have many difficulties and questions and methods and challenges but it would be good to go back to the original question and provide answers. Sometimes social research is difficult, it is easier to go back to theory because they are more comfortable, but our responsibility as researchers is to help people to change system despite barriers, difficulties and reactions.

Regarding the role of researchers, sometimes "we should justify our work in several meeting. Deliverables are a trap into general aim of contributing to sustainable transitions". Other trap is thinking of change in terms of acceleration and going out faster can be a mistake. Maybe slow way of thinking is better. Be careful into solutions to crisis. It is pernicious that researchers speed their work. Slow down and be more reflexive are recommendations for the future. A pragmatic suggestion is formulated and positive considered by participants: in order to learn more about all the projects, formulating a social-environmental problem and see how the different approaches, methods and theories could contribute to solve, it will be an enrichment learning. *How we already do that? Be aware that we are doing to contribute to their capacity of change. How their insights are understood?*

The dissemination of the research results is a core issue. We need to sort out the barriers that universities -and researchers- have in order to enhance our communication skills. How to reach to the public? We have the responsibility to make an effort to engage policy-makers. Policy makers learn from other grounded experiences, but not from research results. We need to provide an interface space that connects mass media, researchers, policy-makers, in order to apply the science outcomes into real life. The variety of approaches of the studies presented in the Pressure Cooker show how fragmented is our research, despite the difficulties to increment the knowledge, the pressure cooker has been a good occasion to reflect on that and talk about future convergences. We are tempted to find a solution for global problems but we need to accept the challenges of long-term effort to find a solution, maybe we can find a small-scale solution. Being more tolerant and flexible with theoretical and methodological approaches is a shared desire. *Science is expected to deliver solutions to global problems but we need to meet together with policy-makers, moving the specific results to different groups of society, engage with and offer solutions.* Social -grassroots- initiatives are talking about emotional things, connections, place-attachment. Agency is related to emotional experiences, "Epiphanies" "*We may found a scientific bias, a lack of knowledge about how to look at emotions, affective bounds and innovations"*.

FOLLOWING STEPS

- To create an email list with people that work on theoretical discussion and share ideas about theoretical approaches.
- To produce a document of proceeding with the minutes of the sessions.
- To prepare an executory brief (with key messages) that gathers the "strong messages" that emerge from all the projects.
- To prepare a Special Issue coming out this pressure cooker, regarding these topics.
- The third pressure cooker will be developed next year but, in the meanwhile, we have time for interacting each other in small groups, with intensity "hot messages" come out. Topic for the 3rd Pressure Cooker will be related to Low Carbon Transition, Inclusivity and justice (we will have a proposal before the end of the year)
- Let´s continue working in this field and discussing about the role of science, a common epistemological ground, insight knowledge to set up.

- Cooperating about the role that EU has regarding research agenda and innovation, promoting connection between scientists, policy-makers and practitioners at EU level. Recent meetings with EU receptivity to knowledge co-production.

XVIII. List of participants.

European Commission Directorate-General for Research and Innovation	Domenico Rossetti
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http://www.transitsocialinnovation.eu/
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http://www.pathways-project.eu/
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3 Agenda