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# Systemic Inquiry: Governing the Anthropocene: Cybersystemic Possibilities?

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# Content

# 1 Zusammenfassung

Vom 30.–31. Juli 2015 fand in Hannover der erste speziell konzipierte Workshop zu 'cybersystemics possibilites for governing the anthropocene' statt, an dem sich 135 Wissenschaftler aus 32 Ländern beteiligten, die alle zur Thematik ‘systemic inquiry’ arbeiten. Unter den Teilnehmern waren 27 Promovierende sowie Vertreter von 35 wissenschaftlichen und nichtwissenschaftlichen Einrichtungen aus dem Bereich systems and cybernetics science. Erstmals trafen sich auch Cybersystemforscher und Institutionenökonomen zu einem gemeinsamen Erfahrungsaustausch.

Das spezielle Format des Workshops erlaubte allen Teilnehmern, sich kritisch mit cybersystemischen Theorien auseinanderzusetzen und Möglichkeiten der interdisziplinären Zusammenarbeit zu eruieren. Der Begriff Anthropozän wurde kritisch diskutiert sowie die Nützlichkeit dieses Begriffes als Organisations-Metapher. Die Rolle von Institutionen, Wissenschaft und Grenzen der aktuellen linearen Ansätze und Modellierungen in Führungs- und Entscheidungsprozessen stellten außerdem zentrale Fragen dar. Es gibt gegenwärtig keine akademische Disziplin, die gezielt Systemforschung betreibt. Dies ist die entscheidende Lücke im Hinblick auf die Vermittlung der Komplexität des Anthropozäns gegenüber politischen Entscheidungsträgern, Wissenschaftlern und Interessensgruppen. Daher sind im Zeitalter des Anthropozäns Investitionen in cybersystemische Governance-Strukturen dringend erforderlich. Viele Teilnehmer waren überzeugt von den potenziellen Möglichkeiten des cybersystemischen Ansatzes, insbesondere seinen möglichen Beiträgen zur Erforschung von Holismus, Integration, Abhängigkeit und Systemen.

Weitere Ergebnisse waren: (i) Ein Blog zu ‚systemic inquiry‘, der neue und laufende Untersuchungen unterstützt und als Sammlung für Materialien und sonstigen Ressourcen dient (http: // www.open.ac.uk/blogs/govan/); (ii) Ein systemischer Untersuchungsbericht zum Erstellen einer Forschungsagenda und Bereitstellung von Empfehlungen für Folgeaktionen; (iii) Der zusammenfassende Bericht für die VolkswagenStiftung und (iv) Eine Reihe von Vorschlägen für Folgemaßnahmen (z.B. Strategiepapiere, ein Journal-Sonderausgabe; Follow-up Sitzungen).

# 2 Summary

An innovative approach to collaborative inquiry called ‘systemic inquiry’ was pioneered in Germany at Schloss Herrenhausen, Hannover on July 30-31, 2015. The Workshop was attended by 135 inquiry participants from 32 countries, among them 27 PhD students and 35 representatives of professional and academic organisations dealing with systems sciences and cybernetics. It was the first purpose-designed event to bring together scholars from such a wide range of organisations concerned with ‘cybersystemics’ and it was the first ever joint meeting of scholars from cybersystemic and institutional economics backgrounds.

The systemic inquiry design allowed all participants to build ‘evidence’ for investment in, and institutional innovation for, cybersystemic capability building and future scholarship. There was critical engagement with the notion of the Anthropocene, and questions raised about its usefulness as an organizing metaphor. The role of institutions, science and limitations of current linear approaches and modelling in governance and decision-making processes were key concerns. The Inquiry also revealed there is no integrated academic discipline centered on systems. This is a key gap in making sense of Anthropogenic complexity for policy-makers, researchers and communities. Investment in institutional arrangements that support capability building to enhance cybersystemic governing praxis in an emerging Anthropocene is urgently needed. Even so, participants were positive about the

potential contribution of cybersystemic scholarship to understanding the Anthropocene, in particular the possible contributions to be made exploring notions of holism, integration, interdependence and systems. Running through many opportunities suggested by the participants was a commitment to, and passion for, trust, collaboration and learning as the hallmarks of systemic governance (in) the Anthropocene.

Additional outcomes were: (i) A systemic inquiry Blog – for facilitated, emergent, ongoing inquiries as well as a repository for table-generated materials and other resources; (ii) A systemic inquiry report for setting a research agenda and providing recommendations for follow-up actions; (iii) This summary report to the VolkswagenStiftung, and (iv) A suite of proposed follow-up actions (e.g. policy briefings; a journal special issue; follow-up focused meetings).

# 3 Scientific results

## 3.1 Introduction

An innovative approach to collaborative inquiry called 'systemic inquiry' was pioneered in Germany at Schloss Herrenhausen, Hannover on July 30-31, 2015. The 135 inquiry participants came from 32 countries (Brazil, Colombia, Germany, Australia, Austria, New Zealand, Mexico, USA, Canada, Sweden, UK, Ireland, Italy, France, Japan, Chile, Ecuador, Switzerland, Spain, Norway, South Africa, Ghana, Belgium, Slovenia, Hungary, Greece, Cyprus, India, China, the Netherlands, Vietnam, Thailand), and 27 of the participants were PhD students studying in nine different countries (Germany, Australia, Austria, South Africa, Sweden, Norway, Colombia, USA). Participants represented 35 professional and academic organisations concerned with Systems and Cybernetics scholarship.

To our knowledge this was the first ever joint meeting of scholars from cybersystemic and institutional economics backgrounds. At least 26 of the latter participants came from Germany or from academic backgrounds in Germany. It was also the first purpose-designed event to bring together scholars from such a wide range of organisations concerned with 'cybersystemics' (cybernetics + systems sciences).

Designed and facilitated by the authors at the Open University, the two day event comprised a mix of presentations and table-based group inquiries. Each table (16 in total) included young PhD researchers, some policy makers, and individuals from research funding organisations. Other evidence was contributed to the Inquiry by 19 invited speakers (22 presenters in total). This design allowed all participants to build 'evidence' for investment in, and institutional innovation for, cybersystemic capability building and future scholarship. Additional outcomes were:

- A systemic inquiry Blog – for facilitated, emergent, ongoing inquiries as well as a repository for table-generated materials and other resources such as photos, copies of presentations and audios of all talks[1];
- A systemic inquiry report for setting a research agenda and recommendations for follow-up actions (e.g. policy briefings; a journal special issue; follow-up focused meetings)

The scientific findings from the inquiry come from three primary sources: the presentations by invited speakers who provided evidence and perspectives for the inquiry process that added to the experiences and understandings of each table-group; the table-based inquiry groups; and the learnings from the design and implementation phases of the systemic inquiry.

[1] See http://www.open.ac.uk/blogs/govan/

We provide a summary overview from the 19 presentations first followed by a summary of outcomes that emerged from the table-based inquiries. Our reflections on learnings about design and planning are reported in Section 4. Before proceeding there are several important points to make concerning the subject of our inquiry:

- Our inquiry and our (global) conversation could be understood as either about 'governing THE Anthropocene' or 'governing IN the Anthropocene'
- Use of The Anthropocene implies it exists independently of observers, has an accepted status and set of known characteristics and dynamics which exist in all contexts and is therefore 'some thing' that can be governed.
- Governing in the Anthropocene is less prescriptive and allows for a range of situations and responses in different contexts. Whilst these distinctions conceal a concern of reifying, in a God-like manner, the Anthropocene as a new era, the shift to 'governing in' moves away from a reification of an era to a need for effective adaptive and contextual (systemic) 'governing praxis' (where praxis is understood as theory-informed practical action).
- In the following the term 'the Anthropocene' is often used for semantic convenience but should not be taken to imply this term, associated ideas and implications were accepted uncritically by the participants in the inquiry.
- Whilst use of 'the Anthropocene' as a framing choice for our contemporary circumstances may have its limitations, there can be little doubt that we are in a period new to human history and that many of the emergent phenomena we experience are the product of human action, even if not due to all humans.

## 3.2 Presentations

Recommendations for future research and on-going inquiry from the presenters over the course of the 2 day inquiry are summarised first.

The presentations on praxis that link with policy by Harrer, Lane and the activities of the Systemic Excellence group (Klein) and the Italian systemic design group provide compelling responses to two of Hagedorn's opening questions, namely: (i) where are the micro - foundations for systems approaches to institutions and governance structures? and (ii) solving real actors' problems in crafting institutions - what have cybersystemic approaches contributed to this? Lane's UK Child Protection (Munro Review) case study is clearly an excellent example as is the Italian case study of localised regional systemic design. However, more examples are needed of investment in research and praxis innovation for building better 'we' institutions (after Vatn) into our governing praxes.

There was a strong and well supported recommendation from the Inquiry audience to invest in producing a set of Policy Briefs for a future World Economic Forum meeting based on the inquiry material and our framings of the problematique. Policy Briefs should respond to Hagedorn's concerns and emulate Lane's prescription for follow-up action, vis: (i) know some good case studies of where cybersystemic approaches have been used effectively (i.e., have access to a repository); (ii) know good systems thinkers/practitioners you can recommend; (iii) be a good systems thinker yourself; (iv) know policy makers who understand and are interested in systems thinking; (v) do good work.

Rechkemmer (2015) argued the need to move towards a collaborative research, teaching and policy agenda on Social-Ecological Justice for Sustainable Development which goes beyond the old triple-bottom line conception of Social/ Environmental/ Ecological towards something more systemic.

Espejo (2015) concluded that in a democracy holistic governance requires the co-production of values between policy - makers and citizens to make visible political and expert guidance and people's interests and concerns. This is more than making information available: it is building up effective organisational systems and aligns with the vision of Beer´s Cybersyn, a cybernetic governance experiment of the Allende government in Chile in the 1970s.

Pier Paolo Petruccio (2015) cited the success that 'design innovation' has had over the past six years in terms of policy support and development at the European level. Design is a driver of user-centred innovation and there is a desire to have this type of thinking and practice institutionalised by 2020. He suggested a similar initiative with cybersystemic thinking and practice, possibly through a systemic design approach.

It is recommended that meetings between scholars/practitioners and policy makers from (i) systemic design; (ii) cybersystemic praxis; (iii) institutional crafting be designed and funded as a means of aiding the development of institutional arrangements that support capability building across these three interacting domains – all with capability to enhance governing praxis in an emerging Anthropocene.

Vatn (2015) claimed that "governance in the Anthropocene implies responding to challenges we have caused at levels beyond the 'local' – it demands reorganizing. Existing institutional structures are ill-equipped to meet the challenges of us operating in environmental systems that are non-linear and characterized by thresholds. Progress lies especially in understanding the non-linearities observed in the interplay between institutions and human motivation. Progress also lies in deepening and strengthening the 'attractor of cooperation' – strengthening institutions that foster cooperative action." He thus aligns himself with the main arguments of Bateson (2015).

Maja Goepel (2015) proposed research focusing on cybersystemically-informed transdisciplinarity; critically challenging current assumptions based on naive systems understandings and building transformative praxis capability that diffuses extant power relations; a research agenda was proposed focussing on role(s) power plays in cybersystemic governance processes; structures which inhibit cybersystemic governance; appropriate scales for cybersystemic governance processes; institutionalizing for Deutungshoheit[2]; and build/invent a lab for ecosystem-based business ecosystems.

Klein (2015), with support from Lane (2015), argued the need for a cybersystemically-informed investment in a 'big science' equivalent on the theme of "social design impact evaluation". His vision is to build a tradition of continuous and transformative research in which society leans more about what we are, and are not, doing in the social systems we inhabit (i.e., research that is critically transformative). Supporting this proposal, Lane argues that the default of TINA (there is no alternative) needs to be surpassed by the continual generation of good examples of what could be; he notes however that many in society appear to be afraid of good examples and are not able to deal well with variety.

Following Lane's logic it can be concluded that there are too few known examples of cybersystemic praxis concerned specifically with effectively 'governing' the social and biophysical in co-evolutionary terms (the work by Ison and colleagues on social learning being a possible exception). There is a strong case for building the evidence base.

[2] "**Deutungshoheit** is a German word meaning "having the sovereignty over the definition of thought," sometimes also called "the prerogative of final explanation." The German philosophers Immanuel Kant and Georg Hegel, for example, could easily promote 'The End of All Things' or 'The End of History' simply because they had written the history of the entire world's people in German language, thus felt they owned world history. Seeing it this way, European dominance over the history of thought is a language trick." – see http://thorstenpattberg.blogspot.com.au/2013/05/deutungshoheit.html Accessed 29th November 2015.

Ison (2015) argued the need to identify institutions that are missing in the broad cybersystemic intellectual field such as: institutions that create 'demand pull' for cybersystemic understandings and practices?; institutions built on circular, systemic, recursive causality rather than linear causality?; faculties of cybersystemic and trained faculty?; actual curricula that deals with the breadth of cybersystemic material that could contribute?; institutions that drive and reward praxis (theory-informed practical action) innovation e.g. 17 SDGs (sustainable development goals) and 24 targets! He proposed investment and research to aid institutional innovation and reform: more politically adept institutions e.g. a cybersystemic Peak Body?; a cybersystemic educators Community of Practice?; a set of cybersystemic governing/governance 'rules' for policy design? Ison called for engagement with the idea of designing cyber-systemic-institutions that can change our co-evolutionary trajectory e.g. exploring requirements for 'company boards' to learn their organisations and account for their structural coupling.

Several speakers raised the concept and processes of co-evolution; many noted that cybersystemic approaches have much more potential than is currently being realised. Research for the design of institutions and innovative governing praxes that move the current co-evolutionary dynamic between the social and biophysical domains towards a more viable trajectory or trajectories is warranted. This links with Richard Norgaard's seminal work on co-evolutionary dynamics (1994) who noted "the weakness of the systems sciences" as a major reason for ongoing development failure, but who also rejects thinking that focuses on prediction and control and the dominant linear paradigm[3].

Telfener (2015) argued that responsibility is an ethical stance, building her case from consideration of (i) the need to refer to epistemology; (ii) the notion of construction; (iii) second order operations and (iv) the depth of our fundamental ignorance. It follows from the cybersystemic framing of governance presented by Ison (2015) that systemic family therapy as a field of inquiry and praxis has contributions to make that, as yet, have not been extensively drawn upon for the central concerns of this systemic inquiry.

Bateson (2015) explored notions of interdependency in her presentation, suggesting that we should 'take the concept of interdependence as being our responsibility to be in and maintain caring relationships – care for the atmosphere, for the oceans.' Taking responsibility includes taking responsibility for oneself - as a form of reflexivity. The theme of responsibility was one that emerged through many of the presentations.

Research done in preparation for the event and presented by Ison provided evidence of institutional failure across the 'cybersystemic' intellectual field which is characterised by institutional and organisational proliferation and limited collaboration especially in the research, policy and educational domains.

## 3.3 Table-based Inquiries

### *3.3.1 Introduction*

The 16 inquiry groups generated a lot of data during the two day event[4]. The key issues emerging from the inquiry groups reported below are based on a meta-analysis of the summaries produced by each table. Inevitably, there is some generalisation.

The purpose of the meta-analysis is to shed light on the framing questions of the inquiry and to draw attention to emerging issues, opportunities and possible actions. Where

[3] Norgaard, R.B (1994) Development Betrayed. The End of Progress and a Co-evolutionary Revisioning of the Future, Routledge, London & New York. N.B. Richard Norgaard was approached to present at this event but was unable to travel.

[4] http://www.open.ac.uk/blogs/govan/?page_id=88

possible, we have indicated a sense of common insights and consensus between tables, but our meta-analysis is not based on emerging consensus. Sometimes, stark differences or individual discussions on just one table can be revealing. We have used the objectives from the original Inquiry proposal to structure reporting of the meta-analysis, although reordered for the purposes of this report, viz:.

- Can representatives from the differing cybersystemic lineages and communities in conversation with each other generate fresh insights into the problematique?
- What contributions might a more institutionally coherent field of cybersystemics scholarship contribute to governing the Anthropocene?
- Can relationships in this field be strengthened between German scholars and the Anglo-Saxon traditions and made relevant to the issue?
- Can the representatives identify a research agenda with potential to realise new theoretical methodological, institutional and praxis innovation able to break with dualistic and linear, causal thinking and acting? What actions are needed to enable this to happen?[5]

### *3.3.2 Can cybersystemic lineages and communities generate fresh insights into the problematique?*

At the beginning of the inquiry, the tables were asked to explore a key question: 'Governing the Anthropocene: Cybersystemic possibilities?' and to identify a range of issues and opportunities associated with the question. The issues identified in the ensuing conversations generated considerable insight into the problematique of governing the Anthropocene. However, there was insufficient time to be able to draw out the different intellectual lineages (primarily cybernetic, systems and institutional economic) within the inquiry and how they might contribute to understanding of the problematique. Nonetheless, the design of the event meant that these lineages were integral to the conversations at each table. The outputs of the tables thus represent the diversity of different cybersystemic communities and their perspectives on governing the Anthropocene. It is clear that the problematique has many different facets.

From the outset, there was questioning of the term Anthropocene itself – its meaning, usefulness and how it could be measured. For some, the term carries a 'selfish', egotistical element which assumes that humans are the most important causal part of global change. For others, the Anthropocene is too 'global' in scope and is largely meaningless at more local scales where changes in behaviour are needed. Participants drew attention to the boundary choices of the Anthropocene and noted the term is only as useful as the extent to which we engage with it and use it to reflect on the socio-ecological relationships at different scales.

Aside from definitions, perhaps unsurprisingly, power and power structures were identified as part of the problematique. Power structures were seen as often lacking transparency, with power and money continuing to be invested in "business as usual" trajectories and thus prohibiting real changes. For some, an inability or fear to name economic systems as a major hurdle is part of the problematique. This raised a fundamental question about who governs (in) the Anthropocene? For some, existing institutions cannot govern the Anthropocene because they cannot (or do not) question their own assumptions due to the continuing dominance of dualistic, hierarchical, non-interdependent, linear thinking.

Allied to this, participants noted the continuing bias in governance towards being independent and competitive as a desired state. This led some tables to question whether it

[5] Summary versions of these objectives are used as headings.

was even possible to govern the Anthropocene because governing implies a goal orientation (though this notion of goal seeking has been denigrated within parts of the cybersystemic community). Current goals of profit and competitiveness have led to the current situation where organisations and companies are regarded as 'successful' when they endanger critically important ecosystems such as the Arctic and rainforest. The competency of business models to recognise or accommodate the complexity of the Anthropocene was cause for doubt.

If business models are lacking, participants were equally concerned about the relationship between science and governance and its limitations. Science and governance processes have found it hard to deal with notions of complexity, scale issues and non-linearity. For some participants, even though science is dis-embedded from political processes, it is still being used as an instrument for governance without appropriate understanding of the science and its caveats or how it can be best used.

There is disconnection and lack of integration between research communities using different methodologies, different scales (local, global, territory, geographical, political etc.). Hence, there is no integrated academic discipline centred on systems – a key gap in making sense of Anthropogenic complexity. These facets exacerbate confusion and complexity experienced by decision-makers trying to use scientific findings. Championing the case for investment and institutional innovation is a role that the VolkswagenStiftung could well undertake and/or facilitate.

Modelling is equally problematic both in predictive power and in the assumptions embedded within models which are rarely explored, questioned or understood. 'Alternative' modelling approaches centred on participation and learning are rarely utilised because they are not part of the scientific tradition. This leads to framing and investigating complex situations as single issues: e.g. global warming can be 'solved' by $C0_2$ reduction. The resulting tendency of science and governance processes to focus in on one dimension using systematic thinking and discussion limits capacity to deal with complex social phenomenon.

Other facets of the problematique were raised including concerns about differences in language and a lack of a common language to make sense of the Anthropocene; and the limitations of skills and concepts taught in universities, professional fora and existing governance institutions to address systemic complexity and interdependency. The speed and systemic nature of possible changes in the Anthropocene mean that education in more general terms is an issue because of the time taken to change paradigms and practices in society and in governance processes.

Drawing on Bateson's presentation, the culture of independence was noted at many tables as part of the problematique because it builds walls between people, and in relation to nature/environment and thus avoids understanding a situation. Learning about and working with notions of interdependence as complementary to cybersystemics was, for many tables, a key strategy for governing (in) the Anthropocene. However, it was also recognised that currently concepts associated with cybernetics and systems thinking are often 'too far away' from ordinary thinking to be meaningful and to provide alternatives.

### *3.3.3 What can cybersystemics scholarship contribute to governing the Anthropocene?*

There was a range of perspectives and suggestions on opportunities and possible contributions from the cybersystemic community. Participants were positive about the potential contribution of cybersystemic scholarship to understanding the Anthropocene, in particular the possible contributions to be made exploring notions of holism, integration, interdependence and systems. Even with concerns about their 'ease of use', cybersystemic

scholarship were seen as key to providing conceptual clarity and (a) language and methodologies to help progress praxis for governing (in) the Anthropocene.

A very positive response arose on several tables following the presentation of Mary Catherine Bateson. Her talk on distinctions between independence and interdependency led to insights amongst participants about opportunities for social learning to learn more about interdependence and the role of trust. Celebrating and utilising human creativity and agency could be a way of transforming the more negative and egocentric discourses centred on the "Anthropocene". For at least one table, the core value of 'interdependence' compared to 'independence' is both the challenge posed by and also the key to making sense of and learning how to act in the Anthropocene.

In a similar vein, suggestions to develop 'Whole System Theory' were offered as a way of developing and deepening a core body of knowledge for governing the Anthropocene and developing understanding of interdependence. Systems language and concepts could be a means to help achieve this across different disciplines. A cybersystemic focus on boundary choices and interdependencies could also be helpful in revealing multiple perspectives available for defining the Anthropocene at a local scale and not just the planetary scale as a means to engage local communities and actors.

Engaging with other perspectives to understand the assumptions that underpin differing world views was considered an important first step to systemically co-approach new narratives of envisioning and describing what ought to be, or become, governing in the Anthropocene. However, engaging with and learning about interdependencies at different system levels will require trust, new skills and understanding. In particular, cybersystems concepts, methodologies and practices could be a way to enable actors to acknowledge and work constructively, in collaboration, with the heterarchy of values, plurality of perspectives and diverse ethical frameworks implicit in governing (in) the Anthropocene. Fundamental to this is the shift in thinking required from seeking 'control' to 'navigation' as a more systems-informed response to managing, rather than solving, the range of complex situations encompassed by notions of the Anthropocene.

As part of the shift to navigation, and in the search for more equitable power relations, cybersystemic approaches were also thought to offer an opportunity to make explicit ethical assumptions and consider responsibilities arising from an appreciation of systemic interdependencies within a context of uncertainty. At least one table suggested efforts could be directed at developing and promoting 'fundamental values' for the Anthropocene, by focussing on 'wellness beyond GDP' as a step in making visible viable alternative systemic economic change where wellbeing is understood as part of the means of production.

Cybersystemic approaches also present an opportunity to reveal and renegotiate system boundaries with decision-makers and escape traps inherent in non-linear methods. Developing cybersystemic institutions that, by definition, question their own assumptions would also require a language of communicating about complex systems which is meaningful and useful beyond scientific communities. In regards to science, a challenge of current scientific approaches is whether they allow the opportunity for navigation rather than control. According to participants, science needs to develop holistic and systemic capacity which embraces uncertainty and which generates epistemological awareness by recognizing, critiquing, developing, using, and choosing among multiple perspectives. Experimental, living labs (new agoras) were suggested, but, in recognition of the significance of locality and context, an imperative must be to abandon reproduce-ability as the test of knowledge. Suggestions were also made to embed science into political processes, recognising that incorporation of different types of knowledge could help to repoliticize knowledge science and begin a process of changing perceptions on the nature and role of science.

Running through many opportunities suggested by the participants was a commitment to, and passion for, trust, collaboration and learning as the hallmarks of systemic governance (in) the Anthropocene.

### *3.3.4 Can relationships between German scholars and the Anglo-Saxon traditions be strengthened?*

Presenters drew on German systems scholars including Vester, Luhman, Jantsch, members of the Frankfurt school, von Foerster, von Bertallanffy and Hegel. Whilst German institutional economics and cybersystemic practitoners and scholars were well represented the inquiry did not receive any input from an active German research and/or teaching programme in cybersystemics (apart perhaps, from participants from several Vienna-based groups). This absence was not from want of trying by the organisers. It remains to be tested via longitudinal evaluation if the Germanic traditions of cybersystemics have expanded due to the event at Herrenhausen. Well received input was made from active German-based praxis groups – Malik and Systemic Excellence.

As organisers of the systemic inquiry, our empirical and experiential evidence suggests there is very limited formalised institutionalised capacity for cybersystemic teaching and research practice in Germany today. This is, it could be argued, a strategic failing, especially given the contributions made by German scholars in the immediate post-war period and up until the 1970s. For example, as Goepel (2015) noted, Erich Jantsch, Club of Rome and University of Hanover articulated a systems approach to university education and innovation (1970) to give it “a new purpose which may be recognized as a means of increasing the capability of society for continuous self-renewal”. There are some exceptions of course, such as the new investments at Leuphana, the University of Lüneburg[6].

We suggest that the Inquiry was a major step forward in helping to rekindle interest in and develop new links between German scholars and Anglo-Saxon traditions, but more widely, from many other traditions. Future collaborations between various participants with WINS, the Wuppertal Institute (Berlin), Ecologic, Leuphana University Sustainability Science Faculty and Prof. A. Thiel (University of Kassel) are under discussion.

### *3.3.5 A research agenda for innovation in theoretical methodological, institutional and praxis*

Given the numbers of participants, their backgrounds and interests and design of the event, as well as the nature of the problematique, the inquiry process did not define and agree a single research agenda or focus on research. However, the design of the event did enable each inquiry table to formulate an actionable system in response to the issues raised during the two day event. Each actionable system incorporates elements of a research agenda. While the details of each system are beyond the scope of this summary report, the following amalgamation of the different table reports represents the main elements and activities. It is not intended to be read as a complete list of actions all at the same ‘level’ since the elements were specific to particular discussions at each table. The intention is to provide a sense of the range and type of activities that could be progressed to develop conceptual, methodological and praxis innovations. The suggestions are:

- Advance the concepts and methodologies of science to include systemic and cybersystemic applications
- Support and explore diverse perspective and normative positions of others
- Develop capacity and use networks to share knowledge of cases, successes and failures

[6] See for more information http://www.leuphana.de/en/university/faculty/sustainability.html

- Make explicit and include ethical framing and assumptions
- Allow co-approaches to develop new narratives of e.g. navigation rather than control
- Review and make explicit (and negotiate) boundaries and scale
- Use models and modelling to promote learning, education and as a tool for citizen participation and democracy
- Acknowledge, explore, enable and learn about interdependency and its diverse forms
- Act on the basis of analysis and awareness of interdependencies and interconnections
- Explore, uncover and challenge/ break-up power structures
- Embrace and value uncertainties in perspectives and decision-making
- Foster action research to apply cybersystemic approaches and philosophy
- Create more reflexive governance systems and institutions which learn from feedback
- Embed cybersystemics in learning and teaching at school – university and in the workplace
- Explore opportunities for circular economy and application of cybersystemics in industry
- Reframe narratives from competitive to collaborative / responsible

The detail of how any one of the above might be enacted will vary according to context and aims. However, collectively, these high level elements point to the need for governance systems which are capable of dealing with uncertainty, able to make plain and incorporate diverse framings, perspectives and feedback and which are able to acknowledge and act with awareness of interdependencies. The need for cybersystemic skills, capacities and learning are evident – a follow-up action could be to facilitate and institutionalise a strong network of systems educators and support an international strategy for building systems literacy supported by the IFSR (see in the Annex).[7] On the back of this initiative we envisage linking with participants in the Inquiry to begin the process of expanding and consolidating an international network of cybersystemic educators and educational organisations.

Another key area is modelling as a form of praxis that may, or may not enhance governing. Models need not be technocratic if they are open to people's participation and learning rather than specifying an end point or an equilibrium position. Our opportunity is to not use models as devices to predict the future, nor as devices to prescribe what the future should be, but as devices which extend our capacity to learn about and appreciate longer term and systemic consequences in governance and to facilitate deciding how to act.

Individual actions and voting patterns for those tables that did vote are available from the Inquiry blogsite.

## 4.1 Self-assessment

We have systematic feedback from the incorporated PhD program which was very positive – many students describing the experience as transformational, but also offering critical insights for future improvement. We have received considerable personal feedback from participants the majority of which is very positive – details of all feedback received to date can be found in the full report. We have as yet no formal evaluation of the Herrenhausen event though one is currently being drafted. We have deliberately left six months to allow our own analysis to be completed in order to fully understand the breadth of discussion at the Inquiry. This will help ensure the survey is shaped appropriately.

Our approach was built on previous experience of designing collaborative systemic inquiries. The experiences at the event confirmed our view that the approach has academic merit in terms of conceptual design, content and outcomes. Above all, the 'systemic inquiry'

[7] IFSR is headquartered in Austria – see http://www.ifsr.org/

exemplified the type of innovation needed to build cooperation that was referred to in the presentation by Mary Catherine Bateson. Arguably more time was desirable – perhaps a minimum of one more day. Pre-workshop planning was reasonably coherent and mostly went to plan. Support from Herrenhausen Palace was excellent before, especially during, and after the event.

There were some problems with recording of the table inquiries which relied on the cooperation and support of PhD students many of whom were unable to be briefed in person prior to the start of the event. Some tables (2-3), despite initial allocations, 'lost' their PhD recorders. Our learning is that the engagement of PhDs in the way we did has the potential to work even more effectively than it did if funding is available for them to gather and be briefed at least half a day in advance of the Inquiry event.

Programming of speakers was difficult because of the German / European holidays, other non-availabilities and the slowness of some invitees to reply. In the end we had a presentational program that was too full, thus minimizing the time for more intense, deeper, table based work and plenary sessions. A busy programme with lots of input meant sharing and assimilation by participants was sometimes difficult within the time frames. But the process of conversation mapping, review and formulation of systems for action helped to overcome (as well as create) some of these difficulties and progress sense-making.

The in-built link to PhD training programme gave PhD students real insights into the debates on systems and the Anthropocene, developed their skills and introduced them to innovative workshop processes as well as enabling them to network with many senior individuals in the systems community worldwide.

We regard the event as an outstanding success given the complexities that had to be negotiated to make it happen, and to operate as effectively as it did. This of course does not mean there is not room for innovation and improvement in future.

## 4.2 Insights

There were many insights regarding the value of interdisciplinary and international collaboration. Perhaps chief amongst them is that there is simply no substitute for face-to-face discussion when bringing together new groups of people from different communities. This is particularly true where conversations are required at deeper levels relating to framings, ethics, experiences, and multiple perspectives and understanding. Face to face engagement is needed to build connections, understanding and trust to enable these in-depth conversations to happen (We note it may be possible to have on-line discussions once participants have met and developed initial levels of trust.).

Given the diversity of the participants and subject area, it was impossible, and conceptually and methodologically inappropriate, to predetermine the outcomes of the meeting. The inquiry was designed to allow for emergence arising from the in-person interactions between participants (at tables and via presenters).

We also note that diversity is key to making sense of the complexity of the situation such as the Anthropocene and the diverse systems community – each complex enough in their own right! Hence the need for international collaboration which the inquiry achieved to enable learning amongst all of the participants of the many different contexts, framings, methodological approaches and insights which reside in the cybersystemic communities.

Feedback since the event suggests that for many participants and the PhD students in particular, the event enabled new links to be made and networks established with many different researchers, academics and practitioners.

## 4.3 Effects of the Workshops

The international perspective of the participants and their contributions to the conversation were a key 'effect' of the Inquiry. In bringing together the systems community to explore the theme, the inquiry occupies a unique place in the history of the cybersystemic community.

For a 2-day event, it is unrealistic to expect longer term effects in terms of final projects or new professorial posts. However, the Inquiry clearly had a marked impact on many participants, revealed the scope of concerns about the Anthropocene and the potential for the cybersystemic community to contribute to debates and offer insights concerning governance.

Inquiry participant, Professor Rik Leemans, has mentioned the possibility to publish with COSUST[8] (based on the Herrenhausen event. Ison with Collins are exploring this possibility and will consult participants about possible contributions. COSUST is a journal that publishes timely short (i.e. 3000 words) review and synthesis papers, but not research papers with new research results or insights.

The organisers are also engaged in communications with the leadership of Future Earth[9], especially Professor Paul Shrivastava (Executive Director) and Dr. Mark Stafford-Smith (Science Committee Chair)[10] about follow-up activity, namely to: (i) invite advice as to how best to work with Future Earth to build a cross-cutting program - either within the Transformation domain, or as a complementary cross-cutting initiative; (ii) invite Future Earth to liaise with John Kineman, the current President of ISSS (and organiser of ISSS2016 conference in Boulder Colorado in the week of 25th July 2016) to co-design/co-host an activity at the next conference developing the Inquiry further; (iii) to explore with Gary Metcalf the current President of IFSR opportunities for IFSR to become a recognised member of the Future Earth collaboration.

Professor Gary Metcalf, President of IFSR and his board member colleagues have already identified possible interest to follow up on this Inquiry with staff at IIASA[11]. A joint event is under discussion – see Annex[12].

On a different track, the Encyclical letter, 'Laudato Si' of Pope Francis (2015) appeared just before our Hannover event. The encyclical offers several framing choices relevant to our 'systemic inquiry' and it is a pity some of those German scholars reputed to have advised the Pope were not present at our event. Conceptually there is much overlap between the Encyclical and matters discussed during our two days. For example:

- When we speak of the "environment", what we really mean is a relationship existing between nature and the society which lives in it.
- Nature cannot be regarded as something separate from ourselves or as a mere setting in which we live
- We are part of nature, included in it and thus in constant interaction with it. Recognizing the reasons why a given area is polluted requires a study of the workings of society, its economy, its behaviour patterns, and the ways it grasps reality
- Given the scale of change, it is no longer possible to find a specific, discrete answer for each part of the problem. It is essential to seek comprehensive solutions which consider the interactions within natural systems themselves and with social systems.

[8] http://www.journals.elsevier.com/current-opinion-in-environmental-sustainability/
[9] See http://www.futureearth.org/
[10] Both of these office holders were invited to present at the Hannover event; both expressed interest but were unfortunately unavailable on the dates.
[11] See http://www.iiasa.ac.at/
[12] IIASA were invited to nominate participants but declined to do so.

- We are faced not with two separate crises, one environmental and the other social, but rather with one complex crisis which is both social and environmental
- Nothing in this world is indifferent to us [humans].

The framings incorporated in 'Laudato Si' are compatible with those offered in the Systemic Inquiry by Simon Ramirez (2015) based on work undertaken at the 'Matriztica School of the Southern Hemisphere', as well as that of many other presenters.

## 4.4 Contribution to the Funding Initiative of the Foundation

In bringing together diverse researchers, practitioners and commentators from around the globe to develop insights into the nature of, and questions raised by, notions of the Anthropocene, the Systemic Inquiry represents a unique moment in the history of the cybersystemic community.

A direct link between the contribution of researchers and a key societal issue was created and possible strategies explored for transforming governance to cope with the systemic nature of the situation faced by society. In these respects, we believe the Inquiry to have made a significant contribution to the VolkswagenStiftung and one which continues its lineage of support for systems based research and scholarship (e.g. Limits to Growth).

We consider there are opportunities arising from this event and research issues that the VolkswagenStiftung may be open to considering under one or more of its current programmes e.g. "New options for the humanities and cultural studies"; "Communicating Science & Research". We note that some programmes are only available to German scholars[13]. As organisers we welcome feedback on what possibilities the foundation perceive for future research based on the outcomes, thus far, of this inquiry.

## 4.5 Public relation and media presence

There are several public relations and media sources relating to the Inquiry.

1. *WINS home page*

https://www.wins.hu-berlin.de/events/governing-the-anthropocene-cyber-systemic-possibilities

2. *A purpose designed Blog site*

All the available material, presentations, audio and table inquiries on open access: http://www.open.ac.uk/blogs/govan/

3. *PhD cohort*

See the section on the Blog devoted to the PhD programme:
http://www.open.ac.uk/blogs/govan/?page_id=44

[13] https://www.volkswagenstiftung.de/fileadmin/downloads/merkblaetter/MB_98_e.pdf
https://www.volkswagenstiftung.de/fileadmin/downloads/merkblaetter/MB_102_e.pdf - see funding line 2 for up to 4 persons?
https://www.volkswagenstiftung.de/en/funding/international-focus/europe-and-global-challenges.html - nothing about 2016 yet.
https://www.volkswagenstiftung.de/en/funding/off-the-beaten-track.html?tx_itaofundinginitiative_itaofundinginitiativelistgeneralfi[controller]=FundingInitiative&cHash=86ac19d79af8e87cba02a00cc02ebb51
https://www.volkswagenstiftung.de/fileadmin/downloads/merkblaetter/MB_Communicating_Science_and_Research.pdf

4. *Also*

https://www.csu.edu.au/__data/assets/pdf_file/0006/1742064/Connections-41.pdf
http://ilws-blog.csu.edu.au/2015/08/27/phd-course-of-systems-thinking/

5. *Publicity elsewhere*

http://www.taz.de/!5230855/
http://www.monash.edu/sustainability/news/news-archive/articles/systemic-governance-germany-conferences

## 4.6 Additional aspects

The design and conduct of this event faced many geographical, institutional and cultural challenges. The fact that it worked so well is testimony to the efforts and generosity of spirit of many people – including staff of the VolkswagenStiftung. A lot of good will has been generated – it would be advantageous to capitalize on this through follow-up investment and activity.

As an organization with the foresight to support the research that led to the Limits to Growth work, and with concerns for the issues our Inquiry broached, the VolkswagenStiftung is well placed to provide international leadership in addressing many of the most pressing issues identified by this systemic inquiry.

# 5 Annex

## 5.1 Proposal from IFSR

A Proposal from the IFSR (International Federation for Systems Research) to Create the Foundations of Cyber-Systemics

The meeting, “Governing the Anthropocene: Cyber-Systemic Possibilities,” sponsored by the VolkswagenStiftung in July 2015, was successful in a number of ways. It brought together professionals from systems and cybernetic organizations, along with experts from related fields of study, whose research and interests were similar but not always connected. The meeting allowed a broadening of both the thinking and the relationships amongst the participants.

Just as importantly, this meeting supported PhD students whose interests and research were focused on cyber-systemic topics, and allowed them to participate with the experts as ideas were being debated and developed. Since that time, a number of other events have taken place. Out of those have come specific needs which require attention and resources. For many years, there have been requests for common introductory materials for students (and professionals) interested in cyber-systemic topics. Despite the fact that complexity is so often identified as a global concern, programs focused on a holistic understanding of complexity and chaos have been eliminated from many universities, in favour of narrow, technological approaches. That deficit has limited the development of cyber-systemic literature, which would normally result from the needs driven by professors and students. While examples of materials exist, most tend to fall within specialized areas of study, or to introduce only narrow and particular theories attached to individual authors and ideas. They do not provide an overview of the most fundamental concepts across the broad fields of study which are affected (This is necessary if students are to learn how to work across specialized disciplines.).

An important next step would be to hold a meeting involving similar participants to those in Governing the Anthropocene: both experts and students involved in cyber-systemic work. The purpose of this meeting, however, would be much narrower. The aim would be to create first drafts of the Fundamental Concepts of Systems and Cybernetics. Since the theories have been developing for over 60 years (and sometimes closer to 100 years), it will require some time and effort to review and prioritize those which are deemed to be foundational (meaning that all students should have at least a basic understanding of them) as opposed to those that are more advanced or specialized in their applications. These concepts would then be encouraged for use in introductory textbooks, university courses, and online sites relevant to the topics. It is hoped that such a meeting could be held before the end of 2016, but absolutely no later than 2017.

## 5.2 List of participants and their affiliations

See below

## 5.3 Publications or other scientific work

There are no publications yet in the public domain directly attributable to the event. However, as noted above, a journal special issue is under negotiation.

The authors of this summary report are currently drafting a full report on the Systemic Inquiry which will be available shortly and will also form the basis for an academic paper.

“Governing the Anthropocene: Cyber-Systemic Possibilities?"
Herrenhausen Palace, Hannover Germany, 30th - 31st July 2015

- List of Participants -

| No. | Family Name | First Name | Affiliation | Role |
|---|---|---|---|---|
| 1 | Abson | Dave | Leuphana University, Germany | P |
| 2 | Aenis | Thomas | Humboldt-Universität zu Berlin | P |
| 3 | Agrawalla | Raman Kumar | Tata Consultancy Services | P |
| 4 | Anderson | Kristi L. | University of Louisiana, Monroe | Doc |
| 5 | Andrag | Birgit | Systemic Excellence Group SA | P |
| 6 | Arzberger | Markus | TU Vienna, Austria | Doc |
| 7 | Banson | Kwamina | University of Adelaide, Australia | Doc |
| 8 | Barbero | Silvia | Architecture & Design, Politecnico di Torino, Italy | P |
| 9 | Bateson | Mary Catherine | Cultural Anthropologist, USA | K |
| 10 | Beck | Yvonne | Aalen University, Germany | Doc |
| 11 | Beigi | Shima | University of Bristol, UK | P |
| 12 | Benking | Heiner | 21stCenturyAgora, quergeist | K |
| 13 | Beusmann | Volker | Universität Hamburg, Germany | P |
| 14 | Bi | Lin | Bertalanffy Center for the Study of System Science, Austria | Doc |
| 15 | Bisseleua | Herve | ICRAF, Kenya | P |
| 16 | Bistagnino | Luigi | Politecnico di Torino, Italy | K |
| 17 | Blachfellner | Stefan | IFSR | P |
| 18 | Blackmore | Christine | The Open University, UK | F |
| 19 | Blewitt | John | UK Systems Society | P |
| 20 | Boenning | Kinga | Leibniz Centre for Agricultural Landscape Research, Germany | P |

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|---|---|---|---|---|
| 21 | Bokelmann | Wolfgang | Humboldt-Universität zu Berlin | P |
| 22 | Bosch | Ockie | University of Adelaide, Australia and ISSS | P |
| 23 | Botha | Lindie | University of Cape Town, South Africa | Doc |
| 24 | Bricage | Pierre | International Academy for Systems & Cybernetics Sciences | P |
| 25 | Bristol-Faulhammer | Michaela | Saybrook University, Oakland, CA | Doc |
| 26 | Buckle Henning | Pamela | Management, Marketing, and Decision Sciences, Adelphi University | P |
| 27 | Bunnell | Pille | American Soc Cybernetics (ASC) | P/F |
| 28 | Castro | Monica | INRA Switzerland | P |
| 29 | Christakis | Alexander N. | Institute for 21st, Century Agoras | K |
| 30 | Collins | Kevin | The Open University, UK | F/P |
| 31 | Cook | Noam | University of Santa Cruz | P |
| 32 | Coral | Claudia | Humboldt-Universität zu Berlin, Germany | Doc |
| 33 | Cornell | Sarah | Stockholm Resilience Centre, Sweden | K |
| 34 | Daniel Allegro | Brigitte | INCOSE | P |
| 35 | Dominici | Gandolfo | Polytechnic School, University of Palermo, Italy | P |
| 36 | Drury O'Neill | Elizabeth | Stockholm Resilience Centre, Sweden | Doc |
| 37 | Edson | Marry | Equipoise Enterprises, Inc., IFSR | P |
| 38 | Ehlers | Melf-Hinrich | The James Hutton Institute, Scotland | P |
| 39 | Eisenack | Klaus | University of Oldenburg, Germany | P |
| 40 | Espejo | Raul | WOSC | K |
| 41 | Ettehad | Elnaz | Centre for Comparative Water Policies & Laws, Australia | Doc |
| 42 | Fa'aui | Tumanako | Auckland University, New Zealand | Doc |
| 43 | Farrell | Katharine N. | Humboldt-Universität zu Berlin | P |
| 44 | Fischer | Thomas | DITF Denkendorf | P |
| 45 | Fossnes | Terje | Norwegian Defence Logistics Organisation (NDLO); Naval Systems | P |
| 46 | Gates | Emily | University of Illinois at Urbana-Champaign (UIUC), USA | Doc |

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|---|---|---|---|---|
| 47 | Gatzweiler | Franz | ICSU-IAMP-UNU | P |
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| 49 | Goepel | Maja | Wuppertal Institut, Germany | K |
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| 51 | Greyson | James | BlindSpot Think Tank, UK | K |
| 52 | Ha | Tuan | University of Adelaide, Australia | Doc |
| 53 | Hagedorn | Konrad | Humboldt-Universität zu Berlin | K |
| 54 | Harrer-Puchner | Gabriele | Head Malik Competence Center Vester, Switzerland | K |
| 55 | Haskins | Cecilia | INCOSE Norway | P |
| 56 | Herrmann | Sven | Ellen Macarthur Foundation | P |
| 57 | Hertz | Tilman | International Climate Initiative (IKI), Germany | P |
| 58 | Hoffman | Robert | Club of Rome, What if Technologies, Ottawa | K |
| 59 | Hubert | Bernard | INRA Avignon, France | P |
| 60 | Iandolo | Francesca | LUISS – Libera Università Internazionale degli Studi Sociali Guido Carli, Italy | P |
| 61 | Ison | Ray | The Open University, UK | K |
| 62 | Jacobs | Marty | Saybrook University, Oakland, CA | Doc |
| 63 | Judis | Renate | Humboldt-Universität zu Berlin | P |
| 64 | Kakoulaki | Maria | Institute for 21st  Century Agoras | P |
| 65 | Kasperidus | Hans | Helmholtz Centre for Environmental Research, Germany | P |
| 66 | Kineman | John | University of Colorado, USA | P |
| 67 | Kiss | Tibor | University of Pécs, Hungary | K |
| 68 | Klein | Louis | SystemicExcellence Group, Germany | K |
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| 72 | Land | Marcelo | University Hospital Complex at UFRJ | P |
| 73 | Lane | David | Henley Business School, UK | K |

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| 74 | Laouris | Yiannis | Future Worlds Centre | P |
| 75 | Lee | Suehye | Keio University, Japan | P |
| 76 | Leemans | Rik | Wageningen University, Netherlands | P |
| 77 | Lenartowicz | Marta | ECCO, Vrije Universiteit Brussel, Global Brain Institute | P |
| 78 | Leonard | Allenna | American Soc Cybernetics (ASC) | P |
| 79 | Lissack | Michael | Institute for the Study of Coherence and Emergence (ISCE) President ASC | P |
| 80 | Lobo | Stella | Hospital Universitário Clementino Fraga Filho, Brazil | P |
| 81 | Machin | Amanda | Zeppelin University Friedrichshafen, Germany | P |
| 82 | Mactaggart | Ivan | President INCOSE, UK | P |
| 83 | McClendon | Karen | University of Louisiana, Monroe | Doc |
| 84 | Méndez-Fajardo | Sandra | Pontificia Universidad Javeriana, at Bogotá, Colombia | Doc |
| 85 | Mendiwelso | Zoraida | University of Lincoln, UK | P |
| 86 | Metcalf | Gary | International Federation for Systems Research, Austria | P |
| 87 | Müller | Albert | Institut fuer Zeitgeschichte, Universitaet Wien, Austria | P |
| 88 | Müller | Karl | Heinz von Foerster Gesellschaft | P |
| 89 | Nguyen | Nam | University of Adelaide, Australia | P |
| 90 | Nguyen | Thich V. | University of Adelaide, Australia | Doc |
| 91 | Niewöhner | Jörg | Humboldt-Universität zu Berlin | P |
| 92 | Ostergaard | Jonas | Malik Management, Switzerland | P |
| 93 | Pahl-Wostl | Claudia | University of Osnabrück, Germany | P |
| 94 | Parker | Jenneth | The Schumacher Institute, UK | P |
| 95 | Paschen | Jana | University of Melbourne, Australia | P |
| 96 | Perez Mujica | Luisa | Charles Stuart University, Australia | Doc |
| 97 | Perez Rios | José | University of Valladolid, Spain and WOSC | P |
| 98 | Perko | Igor | University of Maribor, Faculty of Economics and Business, Slovenia | P |
| 99 | Peruccio | Pier Paolo | Politecnico di Torino, Italy | K |

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| 100 | Polpanich | Orn-uma | Uppsala University, Sweden | Doc |
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| 113 | Smith | Gary | INCOSE | P |
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| 115 | Sriskandarajah | Nadarajah | Swedish University of Agricultural Sciences | F |
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| 119 | Toth | Bill | Saybrook University, Oakland, CA | Doc |
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| 124 | Wallner | Thomas | University of Applied Sciences Upper Austria | P |
| 125 | Wang | Jue | Humboldt-Universität zu Berlin | Doc |

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| 127 | Werner | Liss C. | Tactile Architecture – Office for SystemArchitektur | P |
| 128 | Wilby | Jennifer M | Hull University, UK | P |
| 129 | Wilding | Helen | Open University STiP | P |
| 130 | Wilson | Irma | Future Sharp, South Africa | P |
| 131 | Zatezalo Schenk | Ana | Technische Universität Braunschweig, Germany | Doc |
| 132 | Padmanabhan | Martina | Universität Passau, Germany | P |
| 133 | Hartun | Katalin | University of Pecs | P |

K = Keynote speaker
P = Participant
F = Facilitator
Doc = Doctoral student