Research for a Post-Carbon Future:

Ecologic Institute Scientific Conference

Wasserturm at EUREF Campus, Berlin, Germany

September 17th, 2014

Executive Summary

The EU has taken on the major challenge of transitioning to a post-carbon society. Some communities have embarked on this process already. There are still many technological, political, economic, and social obstacles in achieving such a deep transformation. Visioning where we are headed reveals some elementary questions: *Where do we want to go? How do we get there? How do we know how we are doing?*

The "Research for a Post-Carbon Future" conference convened on September 17th, 2014 in Berlin, Germany. Highlighting transdisciplinary and participatory research methods that integrated the state-of-the-art in socio-economic, technical, and environmental research, the scientific conference explored the objectives, drivers and barriers, and monitoring processes in a post-carbon trajectory. This report summary highlights key contributions from the inputs. Several outcomes emerged from the discussions, as follows:

A changing society requires tectonic realignments: Rapid changes in demographics, technology, and consumption pose new risks of shocks and present new opportunities for transformation. One consequence is that people demand a new type of collaborative science, with co-interpretation of research results among scientists and other stakeholders. But given the demographics trajectory, it is clear that a new economic model focussing on well-being will be necessary to reach a truly post-carbon future. In the meantime, leaders can take advantage of transition points as catalysts to accelerate changes.

Decision making must consider more than models and economic analysis: By its very nature, scientific research is a back-tested process and, therefore, not a reliable tool for predicting the future. Politics and values in society can change, and so long-term targets may need to also be flexible. Finally, energy transition successes have been driven not by national governments (and their evidence), but instead by behavioural and social forces.

CECILIA 2050 OPTIMAL EU CLIMATE POLICY

POCACITO european post-carbon cities of tomorrow

EU low carbon & energy security MILESECURE-2050

A Post-carbon Future

Science, policy, and society

Key Messages

- Changes in demographics, technology, and communication demand a new type of participatory engagement of scientists with the public
- When mapping and measuring a post-carbon future, considerations of resource consumption and depletion should be as important as energy use.
- A new economic model based on well-being will be necessary in a truly post-carbon future.

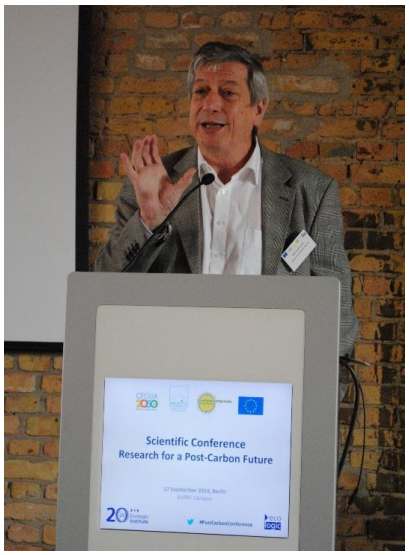
The first session of the day explored the role of science and policy today, as well as what it could and should be in a post-carbon future. **Dr. Camilla Bausch**, Senior Fellow and Senior Management, Ecologic Institute, framed the session by noting, "we need to change the way we do business, we need to change our governance systems."

Prof. Johannes Vogel, Director of the Museum für Naturkunde Berlin, opened up the first keynote speech, *"The future of public engagement with science in Germany,"* with a focus on changing demographics. He mentioned trends in per-capita growth, aging, as well as declining trends in innovation capacity. In the shift from an agricultural to a modern urban society, there is a great need for innovation, which requires a scientifically literate populace.

Prof. Johannes Vogel introduced the concept of citizen science, where citizens work with scientists together. Citing personal successes in the United Kingdom empowering fly fishermen to learn quantitative research methods, Prof. Johannes Vogel sought to demonstrate both that citizens want to engage and that scientists must think differently about the traditional operational model of science.

He ended by noting, "yes we are all in a treadmill [in our day-to-day lives], subject to changes in policy. But we have to think differently." His argument was that scientists need to change their working patterns, and in doing so, innovation could come with citizen participation.

The second keynote address, titled, *"Nexus 'Ressour-cenwende' and 'Energiewende' - prerequisites for a post carbon future"* was delivered by **Dr. Harry Lehmann**, Division Head of Environmental Planning and Sustainability Strategies at the Federal Environ-ment Agency. He focused on important questions in the German energy transition that seem to be unanswered. For example, discussions are concen-trated on the power sector, and should focus more on the transport, heating, aviation and cooling sectors, which seem to currently lack viable non-carbon technologies. Furthermore, many consumer items of today or renewable energy solutions require finite resources that may be depleted quickly. This is a critical consideration when planning a societal transition.



Harry Lehmann delivering his keynote address

Dr. Lehmann remarked that the lessons from the discussion of the *Ressourcenwende* and the ongoing *Energiewende* bring up a final question outside the bounds of policy and technology. “What is the welfare or well-being model of tomorrow?” he asked. “The existing economic model cannot work.” If a post-carbon future will be reached, a new economic system would be necessary, which is a discussion lacking in public discourse.

Dr. Lehmann was explicit in his conclusion that the questions and uncertainties that come with policy making for energy transition “are not reasonable grounds to postpone or slow down the *Energiewende*. We can only learn by doing.”

Setting Course

Where do we want to go?

Key Messages

- Targets can be constantly evolving and should not remain static – they can actually feed into the political process.
- Target setting is inherently a political process, due to the uncertainty in modelling the future and the nature of political compromise. This also demonstrates the need for flexibility.
- Effective, long-term targets can be achieved with credible political support, consistent incentives, and regular monitoring to assess whether the targets remain relevant.

This session, moderated by **Matthias Duwe**, Head of Climate, Ecologic Institute, aimed to discuss the role of setting targets as a means of guiding policy for long-term decarbonisation, exploring obstacles in crafting lasting policies, connecting the concepts of “targets” and “instruments”, and examining how research can contribute to the conversation.

In her contribution, *"What elements make climate targets effective?"* **Dr. Sabrina Schulz**, the Head of Berlin Office for E3G: Third Generation Environmentalism, noted that the process of setting political targets does not always fully take into account evidence and analysis (or may only selectively consider evidence). Target setting is inherently a political process, the panel agreed, but Dr. Sabrina Schulz went further to argue that setting the wrong target level can be counterproductive. “Targets do make sense but not when they are built on false assumptions and are not transparent.”

Benjamin Görlach on the panel

Delving deeper into the topic, **Benjamin Görlach**, Head of Economics and Policy Assessment at Ecologic Institute, shared his thoughts on “*Translating objectives into policy”*. He began with the question, “Do current policy instruments achieve what they are meant to?” Policy objectives are not always identified upfront and can radically change over time with the political climate, as was illustrated by the elevated importance of energy security in light of the 2014 situation in Ukraine. The year 2050 may be far away in political terms, “but in terms of investment and technology, it is right around the corner.” It is critical that policy instruments today consider the investment timeline and rewards investments that are geared for tomorrow and for long-term goals.

Michael Mehling, Executive Director of the Massachusetts Institute of Technology Center for Energy and Environmental Policy Research (CEEPR), steered the conversation to take a more abstract perspective by examining *"The role of climate policy instruments at the international level."* From a legal perspective, Michael Mehling explained that ineffective laws lose functionality. With respect to international climate change objectives defined by the UN, targets are going to be vastly missed. What does that say about the targets themselves? It is critical, when setting targets, to know how value-based terms are defined. Targets need to be seen as constantly evolving and be used "as indicators to then determine how the targets translate to the political process as starting points."

The concept of "moving targets" sparked a discussion on the differences between policies and targets. Policies have the potential to catalyze investment, as was the case with photovoltaics in Germany, Michael Mehling noted. Benjamin Görlach suggested that ideally, "policies would be supplemented by targets." Political commitment to policies would send a signal for investment certainty. Instruments can be designed to help reach targets and simultaneously reinforce their validity. And binding targets send a strong signal of intention and are more likely to be reached (than non-binding), but they come with a hefty political price tag, according to Dr. Sabrina Schulz. Michael Mehling remarked that if targets change over time, we need greater "awareness [of the uncertainty] at the decision making level and more tolerance at the citizen level that we have to participate in the process."

Matthias Duwe recapped the session, noting targets cannot be relied upon as truth but as guides. It is important to develop substantial targets and demonstrate their credibility through policies and instruments that deliver success.

Barriers and Drivers in Society

How do we get there?

Key Messages

- Policy makers and societal leaders can take advantage of transition points and shocks as catalysts to accelerate changes (technical or other) toward a post-carbon society.
- Energy transitions must emerge from society and be embedded in a specific cultural setting.
- Humans are motivated by societal norms and emotions sometimes more than financial incentives when it comes to their interaction with energy.

"We already know what we should be doing. We've had the technology for years. Why haven't we managed to change?" began **Prof. Erik Bichard**, the moderator of this second session and Professor in Regeneration & Sustainable Development at the University of Salford. Facts don't change opinions. Decisions humans make are emotional. Research has shown that behaviour change can come by altering the context in which people make decisions and leveraging norm-based behaviour. In

Prof. Derk Loorbach speaking next to Dr. Grit Martinez and Prof. Patrizia Lombardi

framing the social and cultural dimensions needed in an energy transition, the topic of the "Barriers and Drivers in Society" session, Prof. Erik Bichard continued, "We need to start to think differently about the message of transition. Is it all about information campaigns and operating equipment?"

Prof. Derk Loorbach, Director of the Dutch Research Institute for Transitions (DRIFT) at Erasmus University Rotterdam, began the session with his lead presentation titled, *"How social innovation (em)powers transition."* He explained *"transition"* is structural, fundamental systemic change that is non-linear, and occurs periodically over time.

Shocks or other incidents can become valuable transition points to accelerate change in a more desirable direction and assist in the transition process. The Fukushima incident in Japan, for example, fuelled rapid political action. In addition, "we are seeing a new kind of social mechanism emerging." Social innovation and technology are creating a new social context, as individuals come together to challenge traditional power structures.

Dr. Gabriele Quinti of Laboratory of Citizenship Sciences added his perspective on *"The human factor in energy transition."* Through qualitative research on "anticipatory experiences," or local post-carbon case studies, he argued that the transition process generated behaviour change across different dimensions, as well as socio-cultural stress with psychological implications, which was found to be manageable.

Prof. Patrizia Lombardi, Head of the Interuniversity Department of Urban and Regional Studies and Planning (DIST), Politecnico di Torino continued the session with her contribution, *"Bringing together top-down and bottom-up approaches."* The EU currently lacks its own energy security policy. Top-down and bottom-up approaches, taking into account current energy trends, policies, dependencies, and cultural aspects, need to be developed in tandem.

To wrap up the session, **Dr. Grit Martinez**, Senior Fellow at Ecologic Institute spoke on *"the importance of cultural values in transition: insights from adaptation."* Social evolution has been a consequence of technical evolution, she argued. The evolution of mankind has resulted from new energy technologies. "Transition is only possible if it is embedded in a specific cultural setting and comes from the society." There is a need to examine how our cultures' function, in order to pinpoint the interaction with energy technologies, and to understand how individuals can fluidly transition towards a post-carbon society.

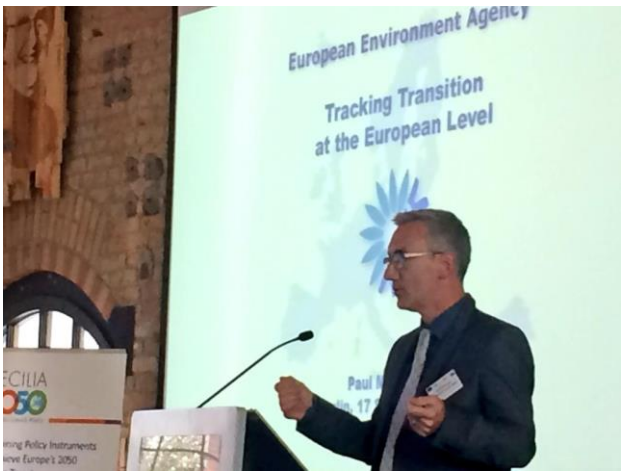
Progress in the Real World

How we know how we are doing?

Anke Herold, International Climate Policy Research Coordinator at Oeko-Institut – Institute for Applied Ecology, moderated this session, which discussed science-based monitoring, measuring achievements, and best practices of post-carbon transitions at different levels.

Key Messages

- It is imperative to create systemic linkages between local and national/supranational levels in facilitating the transition process.
- Lack of information should not be a justification of inaction, but the data that is available should be used to guide action beginning today.
- Current monitoring systems will need to adjust as transition is an evolving process.



Paul McAleavey speaking from the perspective of an information agency

It is not information that is failing, but instead, "risk and uncertainty are not communicated properly," began **Paul McAleavey**, Head of Air & Climate Change Programme for the European Environment Agency (EEA). Paul McAleavey spoke in his *"Tracking transition at the European level*" talk about particular reasons why the decarbonisation process may be falling short of expectations. Transport is so linked to economic growth, for example, that the rebound effect outstrips any efficiency gains in the transport sector. The EEA is currently investigating behavioural and economic topics such as these and how other "lock-ins" inhibit progress towards a post-carbon society.

"Performance monitoring in the Covenant of Mayors and at different levels of EU governance" was presented by **Dr. Silvia Rivas-Calvete** of the European Commission Joint Research Centre. The Covenant of Mayors initiative, with 5,000 municipalities already involved, has the goal of reducing city emissions by 20% through 2020. Dr. Silvia Rivas-Calvete is working on the Emission Database for Global Atmosphere Research, which oversees the baseline emissions inventory process that participating cities in the CoM would use. Beyond developing the specific monitoring tools (which cover heating and transport sectors as well), the initiative aims to initiate dialogue in these municipalities and cities.

Prof. Dr. Kristine Kern of the University of Potsdam and Leibniz Institute for Regional Development and Structural Planning (IRS) continued the discussion with her contribution. She began by noting that the Covenant of Mayors initiative is innovative because it is creating a new relationship between the local and Commission levels. As the European Commission considers reframing what sustainability means and combining climate change plans with sustainable development objectives, it can be very useful to consider the success story of the Covenant of Mayors in systemically linking local and supranational levels. Yet there are two major challenges with the Covenant of Mayors: a) there is not enough scientific work on regional emissions scenarios, and b) there is a lack of focus on improving the policy-science interface at the local level.

Considering Prof. Dr. Kristine Kern's argument that there should be scientific regional scenarios for planning purposes, **Max Grünig**, Senior Fellow at Ecologic Institute stated, "lack of data is a problem at first glance but it does not need to be," if we acknowledge that we do not need to make perfect projections. As he is currently engaged in developing a "*post-carbon city index,"* he remarked that the available data can serve as a guide to initiate action. It is important to not over-invest in rankings and this limited data set, but to recognize indices as evolving over time.

Anke Herold closed the session by reflecting upon challenges in tracking transition. "We did not design systems to monitor a transition process. We designed systems to monitor current targets." If transition is an evolving process with many intangible outcomes and fundamental

changes in the system, our current monitoring systems will need to adjust. And she concluded with the ironic observation, “what we want to achieve at the end is that our monitoring work is no longer necessary – our work superfluous.” In a true post-carbon future, all scientists engaged in tracking progress would be out of work. The transition would be finished.

Supporting a Sustainable Future

Provocatively challenging the status quo of academic research, R. Andreas Kraemer, Director of Ecologic Institute, provided some concluding remarks on moving to a post-carbon society. Reflecting on “citizen science”, R. Andreas Kraemer compared it to crowd-sourcing information, and only involving people in the production of knowledge as input, or a data delivering system. “The debate has moved on.” There must be a co-interpretation of research results that brings together scientists and other stakeholders.

Building off of the day’s discussion of modelling and its role in policy design, R. Andreas Kraemer offered that in looking forward, we must recognize the inherent difficulties of conducting science for future scenarios. By its very nature, science is a back-tested process and, therefore, not a strong predictive instrument to use. Because of this, it is worth considering what role science can really play in future transition processes.

In the policy dimension, synergies and contradictions in policies must be identified. Effective horizontal and vertical policy learning, coupled with evidence-based research, can begin to create a more agile policy process prepared for transition.

R. Andreas Kraemer drawing the strands together

By Adam Pearson and Katherine Weingartner

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