

Post Paris Agreement Progress Report of the International Research Network for Low Carbon Societies (LCS-RNet)

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COP21 marked a significant turning point for global climate policy at [1]. Actually, all nations in the world are called on to address greenhouse gas emissions down to the maximum 2 °C threshold (in the effort to limit temperature increase to 1.5 °C). For this target to be achieved during the next half century, knowledge and wisdom from around the world must be built up and shared. In addition, capacity-building along with technology transfer and financ-

ing are required to enhance low-carbon growth opportunities in developing countries¹. Accordingly, the creation of a research community with a sense of ownership in each country is vital to act as a long-term foundation for policy formulation. Further, the current implementation stage necessarily demands sharing scientific knowledge with non-state actors, including civil society, private industries, the financial sector, cities and local administrative bodies, the actors that will implement

mitigation measures, to trigger action in the low-carbon direction. This means that the way science is done and understood has to undergo major shifts in order to enable the co-creation of relevant knowledge for transition. Research communities themselves can also participate in social change as change agents. Some research groups have begun monitoring and assessing the implementation process of international nationally determined contributions (INDC), and making propos-

als for improvements. According to the IPCC, they are trying to conform to the requirement demanding consolidation of the information on the current status of science and technology, not only on the global and regional scale, but also for each constituent group. Following the Paris Agreement, the role of research communities in supporting the formulation and implementation of concrete and science-based policies is increasingly important.

What is LCS-RNet, what has been achieved and what is the path to post-COP21 development

Activities and Proposals of LCS-RNet over the last 7 years

The International Research Network for Low Carbon Societies (LCS-RNet), started from Japan's proposal at the Kobe G8 EMM, in 2008 [2]. LCS-RNet is a network of research communities engaging in climate policies in various countries. Currently, research institutes in Japan, Germany, France, Italy and UK, in close collaboration with India and Korea, play a key role in the network, promoting cooperation and activities with research communities in developed and developing countries. It has fostered policy proposals targeted at comprehensive and long-term transformation towards a low-carbon society. It also encourages debates on the need for "transition", getting ahead of the times.

First Five Years from 2009 to 2013: Activities as a Venue for Exchanging Climate Change Policy Research amongst Developed Countries

In the first five years from its inauguration to 2013, LCS-RNet has promoted knowledge exchange of

climate policies amongst developed countries through annual meetings, conducted research on common agendas, disseminated outputs, made policy proposals, and introduced policies in each country. After in-depth discussions on major policies over the first year (2008), in 2009 the research scope and the role of science were enhanced and reviewed to conform to low carbon transition that the new climate policy demands for society at large, including economics and social sciences. In the third year, we discussed the possibility that climate policies would become a leverage for new development while, in 2012, we focused on concrete policy proposals, such as energy systems and transition of cities. In 2013, the use of resources and the need for forward-looking investments in sustainable city policies were the key issue. Discussions at the annual meetings were collected into synthesis reports and published in a special issue of the international journal "Climate Policy" (Jan. 2013). Discussions were also reported to each country involved, and were somehow converted into policies in some of them.

Expansion of Our Activities from 2014 Based on Climate Change Transition towards COP21 in Paris

Since 2014 we have focused on preparing possible inputs to COP21 which would be a major turning point in terms of global climate policies. The 6th annual meeting in Italy was the opportunity to discuss energy systems, cities and land-use, international cooperation with developing countries, and, as a major topic, climate finance, which was a crossover with the three topics above [3]. A main outcome of the 7th an-

nual meeting in June 2015, building on previous discussion, was the LCS-RNet declaration, entitled "COP21: A Moment of Truth for Climate and Sustainable Development", which reported directions on important agendas at COP21 [4]. This has provided a major contribution to post COP21 decisions and policies, thanks to the LCS-RNet French research group and the French Government.

Response to the Network's Position Statement and Recommendations at COP21

The core assertions of this position statement are that:

- the policy shift toward the 2-degree target of the Cancun Agreements represents a global and historical major turning point;
- "carbon pricing" to promote future investments must be a common policy crucial to lead the world in this direction, taking into account that the key to transition lies in energy conservation and conversion to non-fossil fuel energy systems, and in the low-carbon development of cities and developing countries, where over 70% of the population will be concentrated;
- in relation to financing developing country cooperation we must break free from the "common but differentiated responsibilities" debate where responsibilities are shifted back and forth, and rather move on to sharing responsibilities at the current policy implementation stage.

Moreover, the statement proposes that the huge investment of funds required for the conversion to low-carbon societies be used as leverage

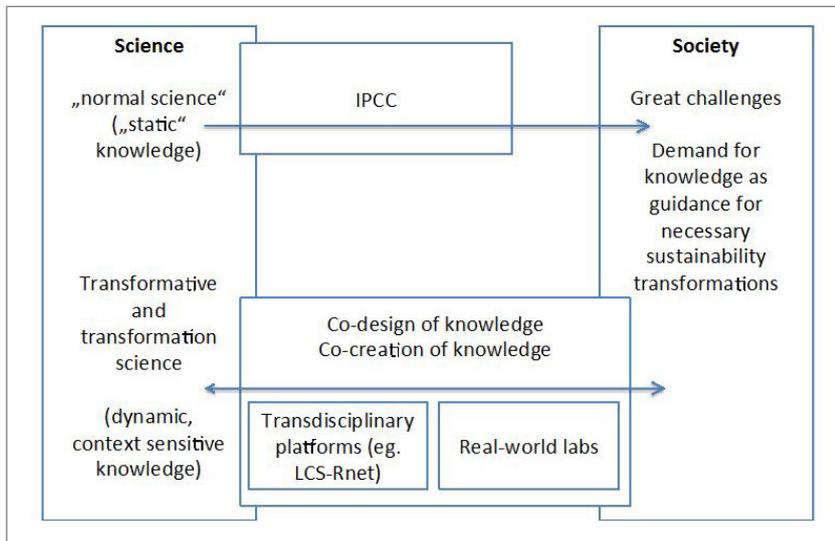


Fig 1 The changing role of science after Paris 2015

to boost the stagnating global economy. Based on forward-looking integrated research on shifting to low-carbon societies via the cooperation of researchers and research institutes deeply involved in the policies of their respective countries, this position statement garnered support in the form of signatures from over 220 scientists from 48 nations –including a Nobel laureate, experienced cabinet members, and 79 IPCC lead authors. The statement was submitted to the Government of France and received and discussed by considerable audience at COP21 side events, held at both the EU and France pavilions. One remarkable result is that Art. 109 of the Paris Agreement retains, slightly amended, one key sentence of the LCS-Rnet declaration about the ‘recognition of the social, economic and environmental value of mitigation activities’. This sentence is the anchor of: “conversion of economies based on various forms of ‘carbon-pricing’ with added social, economic and environmental value”; “effective utilisation

of ‘climate finance’ in developing countries based on proactive administration of the ‘common but differentiated responsibilities’ principle”; and “strengthened capacity-building in developing countries and the orientation of international finance to advance technology transfer”. The use of the enormous investments in urban systems and energy systems required for major social change as a trigger to bring about a “new industrial revolution”, along with the need of linking measures to new economic growth based on actual economies, were advocated.

The Changing role of Science After the Paris Agreement and LCS-RNet Future Plan

Due to the greater emphasis on the transformation of societies towards fully decarbonised economies resulting from the decisions at COP21 Paris 2015 and G7 summit in Elmau 2015, the conception of the role of science has to change. The concentration on scientific subjects will in-

creasingly be driven by the great societal challenges such as, e.g., climate change, as policy and society need increasing scientific knowledge and guidance to successfully design the ongoing transformation processes. Such a change could encompass three major shifts of science:

- Shift from an “inside driven” science to outside driven transformation research perspectives
- Shift from more static scientific knowledge to dynamic, context-sensitive transformation knowledge
- Shift from “normal” science to co-creation of knowledge between science and societies.

Such changes strongly demand rethinking the so far often very successful institutions –such as, e.g., the IPCC– that provide scientific knowledge as a basis for evidence and science-based policy-making. Stronger emphasis is needed on institutions fostering the co-design and co-creation of knowledge between societal actors and science, which in turn needs specifically-designed institutions to enable and encourage such processes. These can be transdisciplinary platforms, such as the LCS-RNet and other science-policy networks, or real-world labs that enable experimenting transition processes in real setting such as cities, companies, etc., or different IPCC working modes in line with its foreseen “solution-oriented expansion”.

Global Climate Policy After the Paris Agreement and LCS-RNet Future Plan

Rationale

The importance of scientific infor-

mation in climate policy goes without saying. From here on, we must recognize that rather than mere restrictive measures on GHG, integrated initiatives for conversion to low-carbon societies are necessary to move the world towards carbon neutrality over the long-term. Likewise, urgent response is required to accomplish this conversion in, approximately, the next 50 years, over one or two generations. The network will continue to grow in importance as researchers and policy-makers will continue to directly contribute to “information compilation” on domestic and foreign climate-related policies and “incite action” from a variety of actors, and as a community made up of like-minded constituents working toward climate stabilization.

In this new context, the LCS-RNet recognises the need to carry out new activities as a “permanent forum for discussion about the future direction of research necessary for climate policies for low-carbon transition, comparative research and assessment on actual low-carbon policies being advanced in countries around the world”, and will undergo a major renewal as the forum enters a new stage.

New developments of LCS-RNet after the Paris Agreement

The policy set forth here below is striving to strengthening the impacts from LCS-Rnet into the decision-making system. Fundamentally, this involves areas that require close watch in working toward creating a sustainable world with climate policy at the core, as well as expansion of the geographic reach, disciplines and target bodies (audience) of research communities, the detection of ef-

fective research issues via intense discussions with target bodies and dissemination of research results, and strengthened coordination with policy and society.

The main goals of the network in the next future are:

1. Contributing to a sustainable world by conforming to climate policies and Sustainable Development Goals (SDGs): Climate change is the first hurdle that must be overcome in the creation of sustainable societies. As such, in the immediate future the utmost effort must be focused on climate stabilisation.
2. Expanding nations’ participation, particularly in joint activities with the USA, China, and major economies and developing countries: based on the Paris Agreement, all nations are to participate in emission reductions.
3. Expanding to developing country cooperation: The Paris Agreement includes both the decision to increase developed country contributions to climate finance and advance capacity-building for effective policy planning and execution on the receiving developing countries’ side via mutual cooperation. To date, LCS-RNet has fostered the Low Carbon Asia Research Network (Lo-CARNet) as a sister network. Centering on this network, joint administration with other nations could be expanded.
4. Establishing legitimacy at the political level and securing funds for activities toward global expansion: The Paris Agreement determined further strengthening of policy on INDCs and strengthening of developing countries’ capacity-building. LCS-RNet will aim for greater impact by positioning its activities within part of this global framework.

Provision of start up activities, funds by each country and joint research programmes are necessary.

5. Advancing joint research related to common issues among participating nations (based on voluntary matchings) and increasing the interaction with policymakers and societies to strengthen new modes of transdisciplinary and problem driven co-creation of knowledge.

LCS-Research Network will implement concrete Measures to achieve the following goals:

- 1. Annual meetings.** Reports on research, discussion of future key agenda items with policymakers and stakeholders, co-creation of research agenda, and discussion of network administrative policy: yearly accumulation of knowledge and dissemination to national governments and others around the world.
- 2. Transdisciplinary deliberation on major issues** and mini-workshops for joint research. A few times a year, deliberations will be held in intimate small transdisciplinary groups on crucial topics, and linked to debate in annual meetings and debate on crucial issues among environment ministries, who are core stakeholders of the network.
- 3. Impact formation:** Emphasis will be placed on impacts by further emphasizing the close connection and joint development of research questions with policy and stakeholders and within efforts to enhance the dissemination of activities through various meetings, media, websites and journals.
- 4. Close cooperation with IPCC.** Having entered the age of implementation, coordination with the IPCC Working Group III has become more important. The up-

A focus on the Technology Transfer Mechanisms; the LoCARNet approach

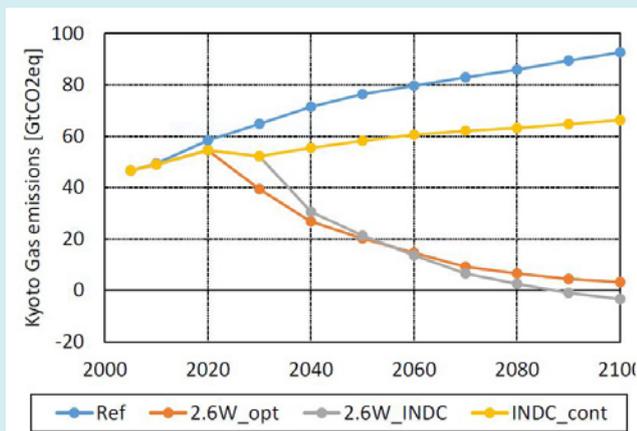
Although modeling exercises show that the INDCs (Intended Nationally Determined Contributions) will be able to peak out the global GHG (greenhouse gas) emissions in 2030 (NIES and MHIR, 2015), after 2030 the GHG emissions pathways proposed by INDCs are far from those required to achieve the 2-degree target. Furthermore, GHG emissions from Asia will be more than half those produced in the world in 2050 without further climate policies. Although the GHG emissions proposed by INDCs in Asia will be lower than that in the reference case, the GHG emission trend will still continue to increase.

Some Asian countries such as Indonesia, Thailand and Vietnam have proposed further reduction targets

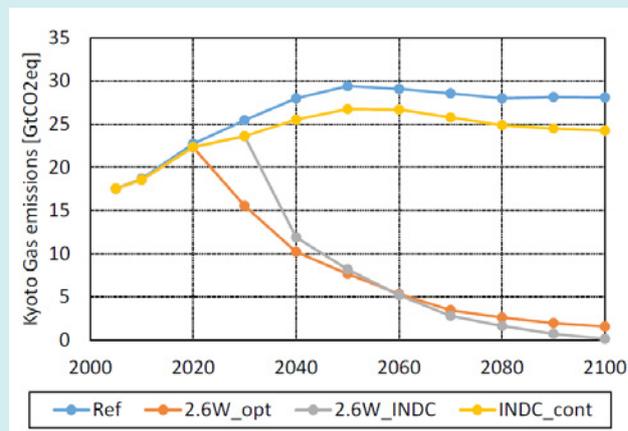
if international support is provided. Thereby, a Global support system including technology transfer, financial support and capacity-building will have to be established to meet the 2-degree target. Of the utmost importance will be the leap-frog development strategies, which will not follow the development pathways undertaken by the present developed countries yet will create new development pathways to keep emissions low from the long-term viewpoint. In order to proceed with such new and long-term horizon pathways, appropriate technology transfers from developed countries to developing countries will be imperative. In addition to the individual energy-saving technologies and renewable energy supply technologies, systems perspective such as urban infrastructure, transportation system, and energy sup-

ply and demand management must be also taken into account. Besides transferring the ‘hardware’ of technologies and infrastructure systems, the support of ‘software’ through capacity-building for use of modeling and other analytical frameworks to carry out comprehensive assessments is also crucial. Transfer of hardware complemented with such software is likely to enhance evaluation and adoption of best options in developing countries.

LoCARNet provides the platform between research community and policy-makers, particularly in terms of technology transfer. The necessary technology transfer and the practical technologies in each country are discussed and assessed by the country’s researchers in collaboration with developed countries.



[GHG emissions in the world]



[GHG emissions in Asia]

Fig. 2 Global and Asian GHG emissions using the AIM/CGE model
 Source: NIES and MHIR (2015) Assessment of INDCs using AIM/CGE[Global] (Ver.1),
http://www-iam.nies.go.jp/aim/projects_activities/indcs/indcs.html

coming IPCC assessments can benefit from the diversity of local, national, sectoral and global research produced by the researchers associated with LCS-RNet and also LoCARNet in Asia. Two key persons from our network, Jim Skea and PR. Shukla, were selected in 2015 as co-chairs of the IPCC Working Group 3 (technology and policy). Stronger impacts will be achieved via a close cooperation with the IPCC within the IPCC's policy on promoting "solution-oriented" expansion (H. Lee, IPCC Chair) and incorporation of community knowledge.

Conclusions

With the Paris Agreement climate mitigation is put to the test. The fact that all countries worldwide have expressed strong political commitment to mitigation weakens the position

of those who argue that no action should be taken domestically until something is done abroad. Hence, there is an unprecedented window of opportunity for action. Thereby the Paris Agreement represents a momentum for transition towards a low-carbon society that raises new challenges for the research community to more actively contribute to solutions to climate change and other great societal issues. Since 2008, LCSRnet has gathered a profound experience in a true bilateral dialogue between researchers and policy-makers and with the LocarNet. A clear success of the network was its capacity to influence, however modestly, the content of the Paris Agreement by supporting anchors to foster the dialogue between northern and southern countries.

Now LCS-Rnet is ready to play an even more active role in co-designing and triggering societal

transformation processes that come out from the effective implementation of the Paris Agreement. The upcoming IPCC assessments can benefit from the diversity of local, national, sectoral and global knowledge produced by the researchers associated with LCS-RNet and also LoCARNet in Asia, as well as on the emerging knowledge on the successful involvement of policymakers and societal stakeholders in the formulation of research questions and relevant knowledge for the transformation. The network can be of particular help to develop the discussion on innovative financial mechanism of low-carbon strategies in North and South countries by COP22 in Marrakech, and also to foster international collaboration on technology transfer. Gilin senicaes hocchic onfessenium poppublic iactum temenati, que pare, cio C. Serfera.

¹ Paris Agreement, Art. 11 <http://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf>

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