



5

Years
Ahead



International
Research Network for
Low Carbon Societies
[LCS-RNet]

“LCS-RNet: Five Years Ahead” was prepared based on the following documents and reports developed by the LCS-RNet steering group members.

- LCS-RNet Secretariat; LCS-RNet Steering Committee; C. Cassen; U. Schneidewind (2016): Post Paris Agreement - Progress Report of the International Research Network for Low Carbon Societies (LCS-RNet): Energia, ambiente e innovazione, 1/2016 (<http://www.enea.it/it/pubblicazioni/EAI/anno-2016/n-1-gennaio-marzo-2016/post-paris-agreement-progress-report>)
- LCS-RNet (2015): LCS-RNet Position Statement
“COP21: A moment of truth for climate and sustainable development”
- LCS-RNet (2015): Synthesis Report of LCS-RNet 7th Annual Meeting 2015
“Towards an Equitable Low Carbon Development - A Science-Policy Dialogue for COP21”
- LCS-RNet (2016): Synthesis Report of LCS-RNet 8th Annual meeting
“How to Achieve Long-Term Transitions towards Full Decarbonisation”
- Wuppertal Institute for Climate, Environment and Energy (2016):
Realising Long-Term Transitions Towards Low Carbon Societies

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Preface

New Role of Research Communities in Transition towards Decarbonised Societies

At the 8th Annual Meeting in Wuppertal in 2016, LCS-RNet discussed the new, transformative role of science as follows:

- Addressing deep-rooted societal problems such as climate change whilst also meeting the radical targets of 1.5 degrees temperature increase, 1 tonne CO₂ emissions per capita and 80–95% GHG emissions reduction in sum demands science to assume a new, more transformative and facilitatory role in coming up with solutions. The process and methods of science should therefore derive from the goal of ‘service to society’.
- Science needs to develop from a conventional, normal and reductionist paradigm to one that is transformative and trans-boundary oriented. Structures of specialised departments and disciplines need to be modified to forward a new science that is inter-disciplinary, trans-disciplinary, and multi-stakeholder based.
- Inter-disciplinary and trans-disciplinary processes imply integration of multiple disciplines, integration of natural and social sciences, as well as collaboration with non-science actors, and adoption of ‘synthesis’ as a major method besides ‘analysis’.
- Multi-stakeholder processes implies continuous interaction and dialogue between scientists and other stakeholders in society, including policymakers, non-government agencies, citizens, and businesses. They also imply “action research” focused on solving critical societal problems.

Looking ahead to 2050 and onwards, the next five years from now will be crucial in establishing firm foundations for the post-2020 framework. As such, in delineating the roles of researchers aimed at climate stabilisation over the next five years, LCS-RNet believes research and actions in the following fields will be necessary:

1. Providing support in strengthening NDCs in each country, formulating policies to pursue steady implementations, as well as contributing to the UNFCCC’s global stocktaking process
2. Development and assessment of long-term (post-2050) low-carbon society strategies
3. Deployment of carbon pricing policies
4. Transforming overall supply chain to low-carbon, from consumption to production
5. Facilitating “Non-state Stakeholder” key players for transition to LC societies
6. Promotion of IPCC and Future Earth-related scientific activities
7. Strengthening science-based policymaking and fostering capacities towards realising low-carbon development
8. Recognising the critical and expanding role of research communities in realising decarbonised societies

In order for LCS-RNet to provide such support for policymaking, it has introduced the “common agenda approach” as a platform to boost the level of activities. The platform provides a space where like-minded researchers, policymakers and other concerned parties around the world can gather, discuss issues, and link science with actions and implementations. Various agendas have already resulted, which have kicked off a number of common activities.

Climate change issues necessarily involve both aspects of rivalry and harmony as regards nature and humankind. To address climate stabilisation, both natural and social science are indispensable. Our wish is for as many participants as possible to join the network so that we may help lay the path towards climate stabilisation.

***“Knowledge and action should go hand in hand;
knowledge and action are one;
knowledge is action, action is knowledge.”***

- Wang Yangming (1472–1529 CE)

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LCS-RNet Five-Year Plan: Looking Beyond 2050

LCS-RNet enters a new phase

The International Research Network for Low Carbon Societies (LCS-RNet), an open platform for researchers and like-minded stakeholders aiming for decarbonised societies through science-based policies and actions, has undergone a major renewal and is now entering a new phase.

Responding to calls for transition in international climate policies

Climate change is the first hurdle that must be overcome in the creation of sustainable societies that are the expected outcome of the SDGs. As such, in the immediate future utmost efforts must be focused on climate stabilisation.

Under the Paris Agreement all parties have agreed to reduce GHGs with the aim of achieving decarbonised society in the early-latter half of this century. The Agreement also urges unified action by multi-level non-state stakeholders such as local entities, e.g., cities; economic entities, i.e., industry, business and financial institutions; as well as civil society at large. In addition, to enhance reduction efforts by developing countries, it was agreed to strengthen international cooperation on capacity building. The Marrakech Partnership for Global Climate Action Agenda was launched at COP22 urging action by all stakeholders, and represents the start of a huge global groundswell of transition.

New role of research community to accelerate low carbon transition

As there is a sense of urgency to complete this transition within half a century, researchers are expected to step into the very frontline of transition and find solutions by promptly reflecting research results into actual policymaking and actions and implementations taken by stakeholders. Therefore, cooperation between researchers/scientists and other stakeholders should be further promoted in a collaborative, unified, systematic and stepwise manner, which includes sharing science-based knowledge, good will, and motivation; planning roadmaps; exploring effective policies; and making the transition happen. Here, “Action research” is the key word.

Since the Paris Agreement, it has become a matter of urgency to build capacity for low-carbon development via relationships between developed and developing countries. The new model supporting developing countries' self-reliance and “leapfrog” development needs asserting with cooperation between developed and developing countries. In this regard, capacity building hand-in-hand with technology transfer and financing are required to advance low-carbon development in developing countries (Paris Agreement: Article 8). Accordingly,

the creation of a research community with a sense of ownership in each country is vital as the bedrock to long-term policy formation.

There is also a palpable rise in awareness of the importance of knowledge sharing and information exchange through research networks, as evidenced in The communique of the G7 Environment Ministers' Meeting (G7 EMM) at Toyama, Japan in 2016, which states "For developing these long-term low GHG emission development strategies, and cooperating with other countries, we acknowledge the importance of research on future scenarios, strategies, and target of each country, as well as knowledge sharing through researchers' networks. We commit to deepen our exchange in this regard from this year on".

Serving as a platform amassing wider knowledge with broader participation

LCS-RNet, right from its beginnings in 2009, aimed to integrate science with policy to realise low-carbon society, and has maintained this mission through chiefly supporting G7 national climate policy through policy dialogues (ref. Appendix: LCS-RNet in brief). However, the Paris Agreement broadened the playing field of actors to include all countries, including developing countries, as well as non-state stakeholders from all sectors. In this regard, LCS-RNet made a decision to enlarge its community, and now aims to boost its impacts in policymaking as well as supports for the related stakeholders to take action, with use of its "common agenda approach". (ref. fig.1)

Activities taking place on the network should be voluntary and autonomous, and are managed with flexibility, which enables the network to deliver research results and outputs in a timely manner, which then generate impacts.

New LCS-RNet: How it works?

Open platform for like-minded scientist and stakeholders aiming decarbonised society by science based policies and actions through common agenda approach

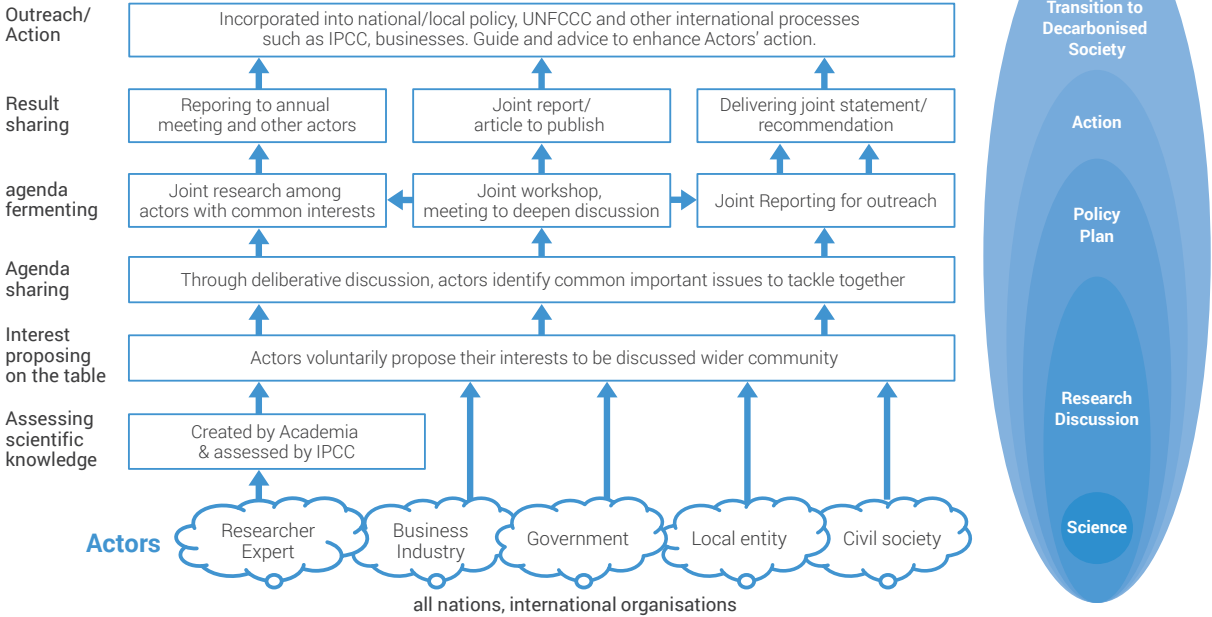


Fig.1: Working mechanism of the new LCS-RNet with common agenda approach

Eight fields to be tackled over the next five years

From the viewpoints of both scientific recognition from IPCC and the Paris Agreement, transition to decarbonised societies by early latter half of this century is indispensable; however, there is limited time for this transition. To stabilise climate, it is necessary to strengthen NDCs as commitments; immediately reduce GHG emissions starting now; create long-term GHG emission reduction strategies with forward-looking visions for decarbonised societies and then form roadmaps in a back-cast manner; facilitate actions to be taken by key-role stakeholders in actual reductions; mainstream routes to decarbonised societies in development policies in developing countries that might be major emitters in the future; and deploy scientific knowledge based on scientific policies and actions.

Looking ahead to 2050 and onwards, the next five years will be crucial in establishing firm foundations for a post-2050 framework, and as such the LCS-RNet recommends research and actions in the following, based on themes raised by members to date (see table 1: List of common agendas).

1 Providing support in strengthening NDCs in each country; formulating policies to pursue steady implementations; contributing to the UNFCCC's global stocktaking process

The earlier GHG reductions take place towards decarbonised societies, the more effective they will be. First, research communities in each country should contribute to strengthening their NDCs as well as promote policy, before considering the post-2020 framework. In addition, research communities will also be requested to conduct methodological research to determine which routes and processes are involved as regards UNFCCC's global stocktaking, to strengthen their NDCs.

2 Development and assessment of long-term (beyond 2050) low-carbon society strategies

The Paris Agreement calls for the establishment of long-term carbon neutral strategies taking into consideration what lies beyond short-term INDCs. It is therefore essential for each nation to create long-term strategies aimed at establishing a carbon neutral world in the latter half of this century, and for such strategies to harmonise with the international context.

3 Deployment of carbon pricing policies

Carbon pricing, in its wider context, is the dominant common global policy in transforming energy, resources, urban infrastructure and human behavior.

Throughout the world there is growing recognition of the need to add on a supplementary carbon price to all economic activities in order to spur low-carbon investments. Much more than just a simple tax, this refers to policies in various forms, such as "emissions quotas (caps)", "carbon markets (Elmau proposal)", regulatory measures, establishment of standards, promotion of divestment and behavior change. A bundle of effective policies need to be established through evidence-based arguments.



4 Making the overall supply chain low-carbon, from consumption to production

A systematic, overarching approach encompassing consumption, distribution and production, namely “sustainable consumption and production” is required. For example, reducing “food loss” at the stage of final consumption affects all the prior processes, i.e., energy used for transportation, processed volume, agricultural production and fertiliser consumption, all of which contribute to GHG reduction. Deep-reaching cuts in energy use throughout the entire cycle linking production to consumption are therefore required.

5 Encouraging “Non-state Stakeholders”, the key players in the transition to LC societies

Strengthening dialogue and partnership with non-government stakeholders, namely private industry, the financial sector, as well as cities, local entities and civil society is required. Since COP21, negotiations have scaled-down, and we have now entered a new age of reduction implementation in which the action groups stated above will begin to play central roles in actually advancing reductions. Henceforth, focuses should be shifted from national policies to wider implementations via these new actors.

Financial entities will play a catalytic role in accelerating low-carbon investment, in both developing and developed countries, as well as to change the investor mindset from short-sighted to longer term, with more insight by providing clear signals on firm low-carbon and decarbonised visions.

6 Promotion of IPCC and Future Earth-related scientific activities

We need to amass and evaluate the latest science related to climate change and transition to decarbonised society, as well as accurately deliver the results to the actors concerned. Having entered the stage of implementation, coordination with the IPCC Working Group III has attained more importance – specifically, close cooperation with the IPCC under its policy of promoting “solution-oriented” expansion (H. Lee, IPCC Chair) and incorporation of community knowledge will realise stronger impacts. Global science communities have been promoting actions to address sustainability through the Future Earth scheme, etc., which invites researchers and experts to actively participate.

7 Strengthening science-based policymaking and fostering capacities towards realising low-carbon development

Under BaU scenarios, emissions from developing countries will rise several times above those from developed countries, which means there is potential for mutual benefit in cooperation addressed at low-carbon development as well as preventing developing countries from heading down the slippery development path of high energy-dependency. This is because, under the Paris Agreement even developing countries need to aim for societies that incur CO₂/capita emissions of less than 2 tonnes per capita after 2050, which means that they might be able to leapfrog directly to low-carbon societies and enjoy the late-comers’ advantage of not being trapped into “high-carbon lock-in”, something developed countries are now struggling to escape from. To promote “low-carbon development”, we need to establish research communities that have full ownership in support of projecting low-carbon development scenarios, deploying low-carbon technologies, approaching financial resources and domestic institutionalisation of capacity building. At present, as major economies

suffer from a slowdown in economic growth and infrastructure investments, prompt responses are required to help them escape from such lock-in scenarios.

8 Recognising the critical and expanding role of research communities making it happen for decarbonised societies

Scientific knowledge is the basis for reasoned decision-making to transit to low-carbon. However, the urgency of the transition, as well as our relatively limited academic inexperience in the subject means the science and research community needs to assume a new role to tackle it, in other words, become the acting stakeholder, or “Change Agent” who explores new knowledge as it appears in this ever-changing world and applies it directly to real policies and actions via co-work with stakeholders (Action Research).

How will the “new” LCS-RNet strengthen its impacts?

Since the Paris Agreement, the range of major actors in GHG emissions reduction was expanded to include every nation, including developing countries, as well as policymakers and actual stakeholders conducting implementations for GHG emissions reduction. The new LCS-RNet should therefore invite as many participants as possible (not only from G7 countries), diversify cooperation modes, strengthen cooperation with related stakeholders, facilitate knowledge-sharing and information-exchange within and outside of the network, and reinforce impact generation towards global and domestic climate policies.

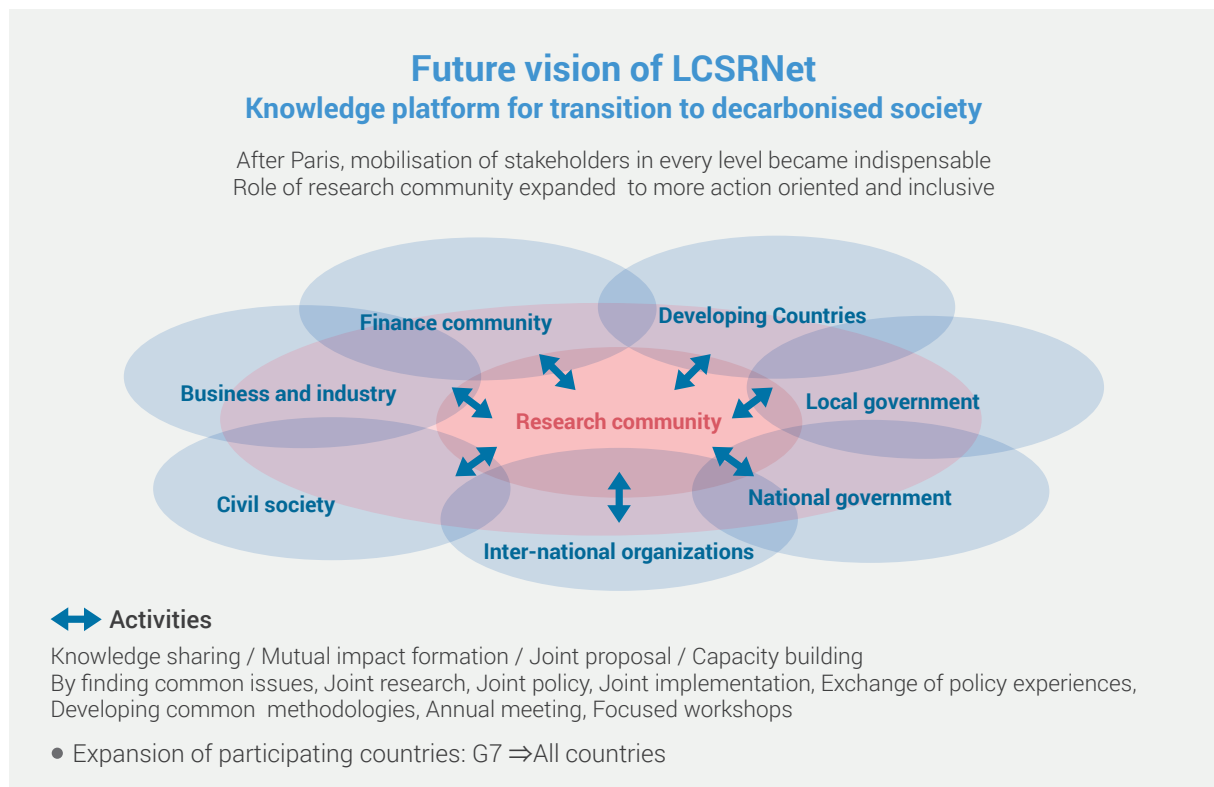


Fig.2: Expanding role of research community to work with variety of stakeholders



1 Expansion of participants:

LCS-RNet was derived from the G7 Environmental Ministers' Meeting –in which Brazil, China and India have already been heavily involved with—but we aim to expand on this. Some LCS-RNet member research institutes have their own regional/local networks (for example, UKERC in UK, and IGES and NIES have a research network in Asia [LoCARNet]); therefore, we intend to expand our regional network in harmony with other such networks.

2 Strengthen outreach to non-state stakeholders:

As noted in the previous section, since the Paris Agreement, collaboration with non-state stakeholders is now the key to progress, which means that research communities need to co-work with the stakeholders and co-design future societies as the core to “action research” to help promote transition to low-carbon and decarbonised societies.

3 Diversifying collaboration mode:

A number of diverse operation modes aimed at actual implementation will be proposed through the “common agenda approach”

- **Activities spanning information-exchange, joint research and joint proposals:** Starting from knowledge sharing on important issues raised by members and information exchange on policy evaluation and experience, the network will co-develop policy tools and methodologies, conduct joint research, apply for research funds, and make joint proposals. Annual Meetings will provide venues for discussions over future directions on how research communities can contribute, based on such activities. The network will also widely disseminate its knowledge, through publications such as academic journals, documents, textbooks, guidebooks, and so forth.
- **Policy recommendations from research communities:** The research community en-masse represents a powerful force as a stakeholder in the climate policy process, and as such it should feel obliged to project clear policy messages, such as in the LCS-RNet Position Statement: “COP21: A moment of truth for climate and sustainable development”, with strong recommendations derived from sincere deliberation processes.
- **Training workshops for the next generation of researchers and policymakers:** Capacity development for future generations to reinforce the basis for policy formulation is a matter of urgency. Already, such actions have been taken by CIRED (International Research Centre on Environment and Development, France) and NIES (the National Institute for Environmental Studies, Japan). Through these activities, an expansion in information and knowledge sharing, as well as participating countries and research institutes will result. Currently, the participation of China, India, Brazil, Viet Nam, and others is under consideration.

4 Delivery of research results hand-in-hand with progress on international climate policies:

The IPCC, where discussions on international climate policies and climate science take place, has already been presented its midterm schedule (fig.3), and the network now needs to link science with policies and

strengthen its impacts by disseminating research results and outputs to relevant partners and audiences in a timely and appropriate manner.

- UNFCCC COP and SBSTA offer excellent opportunities in terms of research support for policymaking. Contributions from authors to the IPCC as well as expert participation in IPCC related workshops would also be effective in order to reflect scientific knowledge with IPCC's evaluation.
- Reflection of IPCC (AR6) evaluation results into policies (due to start around 2021) is one of the critical agendas the new network should tackle. The network also needs to deepen its partnership with ICSU/ UNESCO's Future Earth programme as well as the UN's SDGs, as both are linked at the core with climate change.
- **Tackling flagship projects:** Two years prior to COP21, LCS-RNet held intense discussions on the future roles of research communities and agendas under the new framework. These discussions at two annual meetings in Rome and Paris led to a flagship Statement which contributed to the Paris Agreement. Such flagship brainstorming projects can bring LCS-RNet members together in a timely manner and generate powerful impacts.

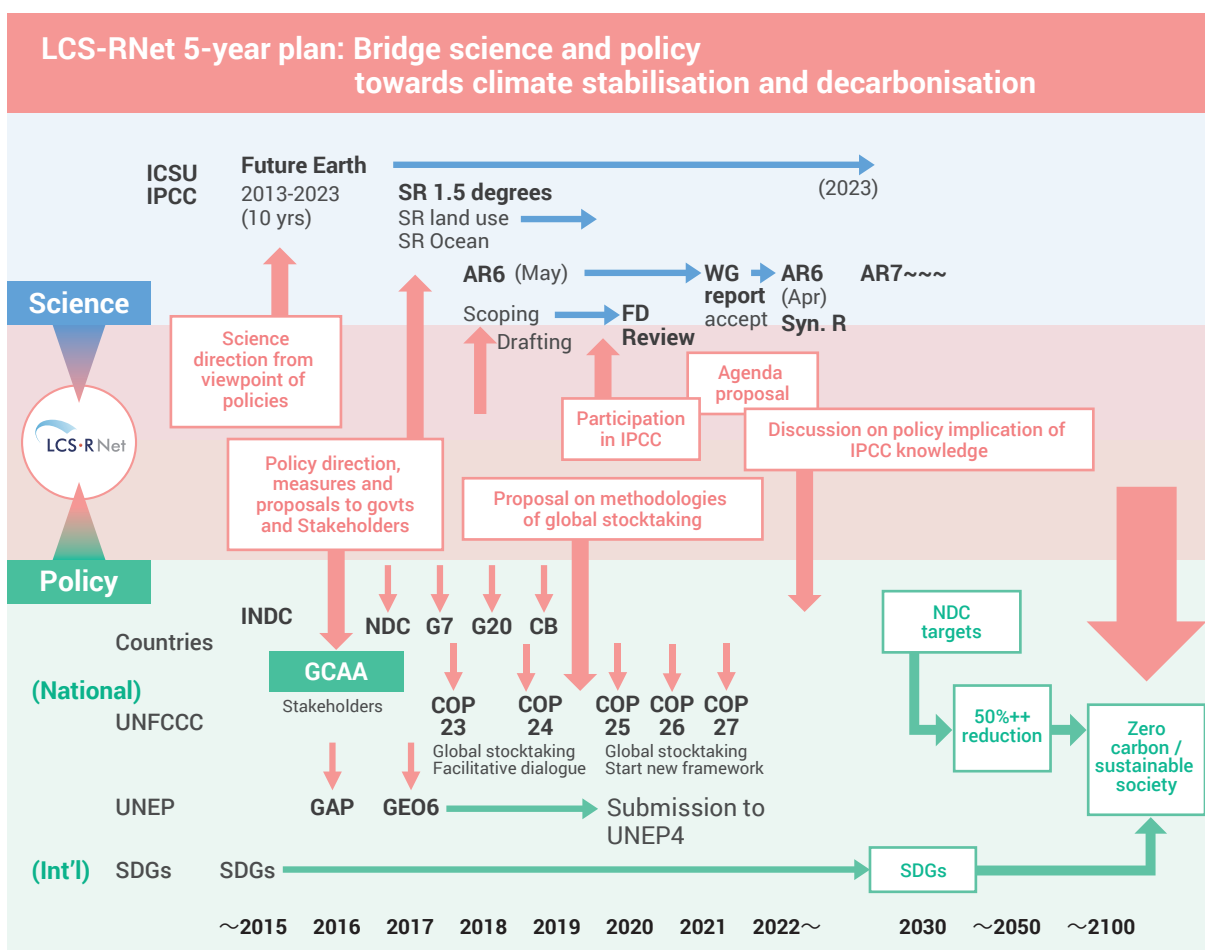


Fig.3: Timely impact formation in line with international climate policy process



5 Strengthening PR/outreach function

In order to activate networking activities, and to reinforce impact generation, LCS-RNet will strengthen PR and outreach activities for target audiences such as science communities, policymakers, non-state stakeholders and donors/providers of research funds.

- Development of the LCS-RNet five-year plan: LCS-RNet needs to present its course of actions inside/outside of the community by developing a midterm activity plan (this report), and updating such annually with a report of activities and research directions.
- Various tools for PR/outreach and information exchange: LCS-RNet will prepare websites to share discussions on “common agendas”, research schedule/proposal, research results, recommendations, schedules of meetings and workshops, information and announcements from the Secretariat, and so on.
- Visualisation of results of common agendas: for example, via special issues of academic Journals (e.g., publication on 1.5 degrees to contribute to IPCC), publications related to annual meetings (e.g., ENEA Speciale*¹: Transition and Global Challenges Towards Low Carbon Societies; and WI Spezial 53*²), textbooks (e.g., A Primer on Low Carbon Societies*³: Secretariat), and so on.
- Co-branding: Joint organisation of conferences, meetings and workshops, and joint publication should be further promoted (e.g., organising LCS-RNet 5th Annual Meeting back-to-back with the 6th International Forum for Sustainable Asia and the Pacific (ISAP2014) in Japan; Co-organising the LCS-RNet 8th Annual Meeting with the International Sustainability Transitions Conference in Wuppertal, Germany, 2016; Co-organising the LCS-RNet 9th Annual Meeting with UKERC research meeting, 2017).

6 Securing funds for LCS-RNet activities

In order to promote research activities and strengthen its PR/outreach function, LCS-RNet should review its current budget portfolio and boost fund-raising. The recommended route is for members and participants to secure their own research budgets, use the same for joint research, and also conduct PR and outreach activities through their regular channels and networks. For Secretariat operations, the budget should cover promotion and coordination of joint activities and research. LCS-RNet as a whole should explore various fund-raising opportunities and seek to obtain contributions from multiple funding sources, including governments of member countries, not only from Japan’s Ministry of the Environment.

*1. ENEA Speciale: <http://www.enea.it/it/sequici/publicazioni/pdf-eai/speciale-transition-and-global-challenges/eai-speciale-i-2015.pdf>

*2. WI Spezial 53: <https://epub.wupperinst.org/frontdoor/index/index/docId/6636>

*3. A Primer on Low Carbon Societies: https://lcs-rnet.org/pdf/publications/lcs_Primer_on_Low_Carbon_Societies_e.pdf

Governance: Open, flexible and participatory

To address the big challenge of transition to decarbonised societies within a very short time period, research communities have to hold discussions with many of the concerned stakeholders, not withdraw into a shell of research societies, and deliver the necessary ideas for transition to societies in a proactive, timely manner, by encouraging freewheeling, novel and flexible thinking. LCS-RNet operates under no formal code of conduct—and acts autonomously by amassing the resources and capacities of all participants under an open-door policy and flexible management system. Such basic principles should be carried forward into the new phase.

As well as the above, in response to the growing importance of supporting policymaking, its governance structure needs to be reinforced by enhanced co-working between the research community and governments, such as through a government Focal Point council, as well as fortify its secretariat function with funding support from member countries.

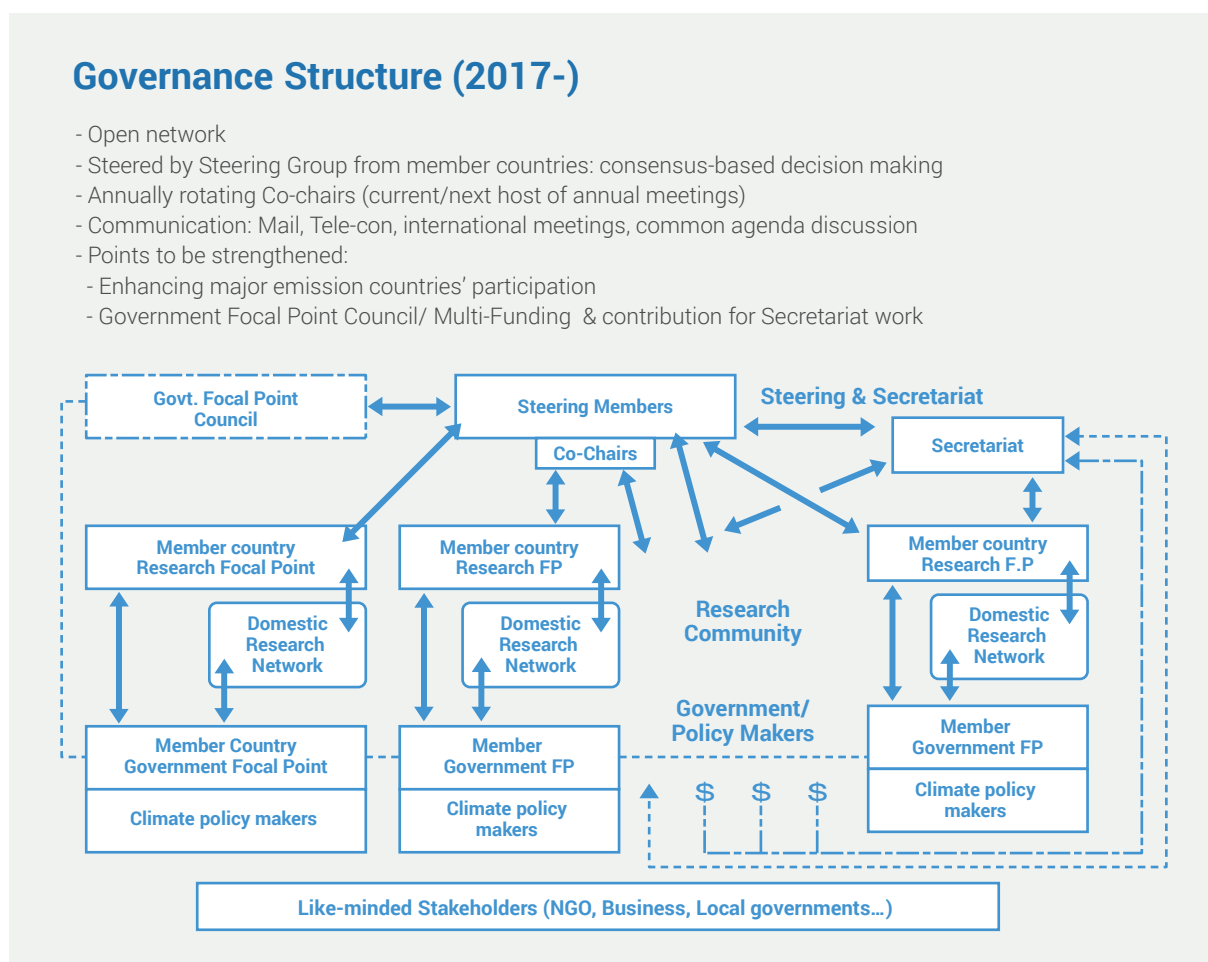


Fig.4: Governance structure of the new LCS-RNet

- **Overall structures (fig.4):** In each participating country, at least one research organisation works as a country research Focal Point in close collaboration with the relevant government bureau in charge of climate and/or energy. The research Focal Point acts as bridge and node between international and



domestic research communities, where considered necessary, and hosts annual LCS-RNet meetings in rotation among steering countries.

- **Decision-making structure:** A steering group, composed of members nominated by each research Focal Point, will organise the platform, with support from the Secretariat, and also supervise the network. Two co-chairs, who act as representatives of the LCS-RNet, are nominated from the steering group every two years. The Secretariat, under the guidance of the Steering Group, conducts daily operations.
 - In consideration of the intended expansion of the member countries and member institutes, and to incorporate the advice and strengthen supports from each government, the LCS-RNet steering group member selection process will need to be reviewed. To carry out such review, LCS-RNet proposes to establish the “LCS-RNet Government Focal Point Council”, composed of government members. Further, an advisory board, to strengthen collaboration with member countries and other related stakeholders, needs to be set up, such board being titled the LCS-RNet Advisory Board.
- **Activities by participants:** Participants will propose themes and agendas to be jointly addressed for discussions carried out by the network; promote small focused working groups; organise thematic workshops; and report on such themes and agendas at the annual meetings. They will carry out joint research, share results, and broadly disseminate such as proposals and recommendations.
- **Secretariat’s function:** Currently, the Secretariat has four members who assist the steering group via the following functions:
 - Decision-making support: Develop an annual plan; set-up, organise, develop memos of the steering group meetings (tele-conferences); harmonise views among steering group members, if necessary.
 - Drafting of activity plan: Draft, coordinate, publish and disseminate LCS-RNet’s five-year plan; organise workshops; make plans for joint-research and joint publications.
 - Fundraising: submit annual plans to Japan’s Ministry of the Environment (MOEJ); obtain funds; and keep MOEJ informed of activities.
 - PR and outreach: information dissemination through meetings, website, brochures, etc.; share useful information with members
 - Organise meetings and workshops: Organise annual meetings, in close cooperation with research Focal Points (help research Focal Points develop outline papers; draft meeting programmes; invite experts; organise meetings; develop synthesis reports, etc.); hold other meetings, side-events, and workshops
 - Publication and editing: plan and conduct joint-publication and editing (e.g., Journal Special Issue, Primer on LCS, etc.)
- In response to the expansion of new activities, it is necessary to clarify the Secretariat’s function, to share responsibilities amongst participants, and to secure funding to support further activities.
 - Annual meetings have already been hosted by presiding host countries, in rotation, and supported by the relevant country’s government.
 - In principle, participants from developed countries defray the costs of attending annual meetings and carrying out other activities.
 - In the future, it is expected that each member institute will bear the responsibility in organising the Secretariat function in accordance with their capacities.

What are the emerging research agendas to be tackled jointly?

Through past discussions among LCS-RNet, critical and urgent agendas as indicated below have been raised by the participants. These proposed agendas will be put on the table of LCS-RNet for joint/comparative study among member institutes who express an interest, for information-exchange among researchers, policymakers and stakeholders concerned, and to call the world's attention to the changing agendas.

Concrete "common agendas" are listed in below. Some items raised in the list are already in motion or about to start, while others are still at the discussion stage.

Table 1: List of common agendas and activities in the table (as of march 2017)

Lead organisations are underscored (acronyms in Box 1, Appendix)

Activity	Theme	Major target	Status
Joint research	Comparative study on long-term strategies and scenarios	National strategy/ UNFCCC stock-taking	Ongoing
Joint research	Development of "Template" for enhancing transparency of models: tool for simplifying cause-result relations in scenario/models	National strategy	Ongoing
Joint research	Toolkit/Dashboard approach for comparison of NDC/ LTLCS performance:	National/ UNFCCC process	Starting
Joint research	Transition strategy of energy intensive processing industries: How do we deal with the hard core of GHG emissions?	National/ Local policy	Proposed
Joint Research	Analysis of energy-materials relationship, for deep-reaching cuts into energy use throughout the entire cycle linking consumption and production.	National Policy and trade issue	Proposed
Joint research	New LC financial mechanism to promote world economy: How low carbon investment can revitalise stagnant world economy.	International economic arena	Proposed with Brazil and India
Joint Research	Deployment of "carbon pricing" policy: Limiting usable carbon (Carbon Budget) inevitably involves carbon pricing policy; the ongoing argument concerns its design, in domestic and international contexts.	National policy with global context	Proposed & in preparation
Joint Research	Joint research with developing countries on Long term, Low carbon development strategies: Developing countries and major economy countries hold the keys to reducing global GHG reductions. Collaboration with such countries for science-based policy making is one of the issues the research community can contribute in.	Policy making process for developing countries	Ongoing
Joint research	Co-work for Alternative pathway: Leapfrog development Small developing countries that are already carbon neutral may have the potential to be front-runners in low carbon development.	Developing country's policy/ International Development Organisations	Proposed (study already started)



photo: Andreas Fischer. (c) Wuppertal Institute

France	Germany	Italy	Japan	UK	Others
ADEME CIRED IDDRI	WI		NIES/IGES		
CIRED	WI		(NIES)		
IDDRI			NIES/IGES		
	WL		IGES		
	WI		NIES (Modeling) IGES (SCP)		
CIRED					
CIRED	WI (Carbon Market / CDM)		IGES (JCM)		ERI, China Korea, (Carbon Market)
ADEME CIRED		ENEA	NIES/IGES LoCARNet		Brazil, India, China, ASEAN, Africa,
	WI with Iran GIZ	ENEA with Comoro	IGES/ NIES LoCARNet with Bhutan		Comoro Islands Bhutan, Iran

Activity	Theme	Major target	Status
Info. exchange	Participatory process for designing long-term LC Strategies: Methodology is not yet established in Japan.	National policy	Ongoing
Joint Publication	On the 1.5 degree target: Editing a special issue of "Energy Management" Journal as joint contribution from LCS-RNet community to UNFCCC/IPCC assessment.	IPCC & UNFCCC decision	Ongoing
Capacity building	Edit and publish textbook "A Primer on Low Carbon Societies II": To disseminate the basics of low carbon transition, a "Primer" series was started in 2016, and is the second textbook concerning NDC and SDG synergies.	General educational purpose	Planned
Ongoing Discussion	New role of Research/ Future agenda		Discussed at annual meetings and beyond

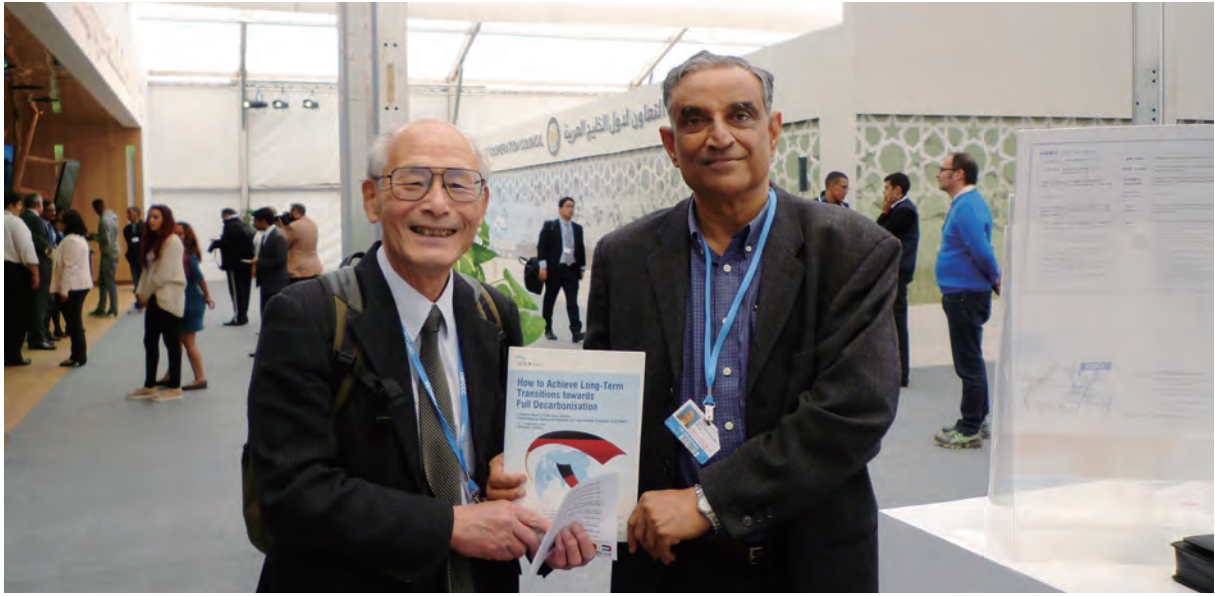
<Common Activities>

Activity	Theme	Major target	Status
Five-year plan	Edit and publish LCS-RNet's Five-year plan "Five Years Ahead" (This Document), to disseminate LCSR-Net's principles and activities, to indicate research needs and direction of low carbon transition.	Members, policy makers, stakeholders, funding agencies	Edited
Extension of Network	Extend participation of major GHG emission countries and major stakeholders: Paris Agreement requires action by all countries and major action stakeholders of all levels, therefore strengthening the impact of network activities and soliciting their participation is crucial.		Starting
Joint Training Network	Extension of network of scenario training summer school: Knowledge sharing with next generation, developing countries, policymakers and stakeholders is also the role of the research community. Training workshops have already started in Europe and Asia. Expansion of such activities to include wider action players will substantially contribute to expanding LCS-RNet's impact.	Synergy of education and networking purpose	Proposed and in preparation
Joint Meeting	9th LCS-RNet Annual Meeting, UK (12-13 Sept. 2017 Warwick) back-to-back with UKERC Meeting. 10th Annual Meeting in Japan 11th Annual Meeting in Italy	Members and stakeholders	Drafting Agenda by UKERC & Secretariat Planned Planned
Joint Meeting	Government Focal Point Council Meeting: To strengthen mutual impact with government Focal Points, the secretariat proposes establishing the "Government Focal Point Council", back-to-back with annual meeting.		Proposed
Joint workshop	As a part of joint research and activities, workshops are held when necessary.		
Publicizing	Side Event at UNFCCC/COP 23 Bonn: Disseminate results of LCS-RNet's activities and discuss with wider audience to strengthen impact.		Planning
Fund raising	To respond to the increase in issues and challenges facing the research community, fund raising for joint research and activities and secretariat work is crucial.		Discussing in steering group



France	Germany	Italy	Japan	UK	Others
DGEC			<u>IGES</u>		
CIREN	(WI)	CMCC/FEEM	<u>NIES/IGES</u> <u>LoCARNet</u>		India (IMM) others
			<u>Secretariat</u> <u>NIES/IGES</u>		India
<u>CIREN</u>	<u>WI</u>	<u>ENEA</u>	<u>NIES</u> <u>IGES</u> <u>Secretariat</u>	<u>UKERC</u>	

France	Germany	Italy	Japan	UK	Others
<u>CIREN</u>	WI	ENEA	IGES NIES Secretariat	UKERC	
<u>CIREN</u>	<u>WI</u>	ENEA	IGES <u>LoCARNet</u>	UKERC	Brazil, India, China, ASEAN, Africa
<u>CIREN</u> Brazil, India, China, Vietnam			<u>NIES</u> <u>LoCARNet</u>		
CIREN ADEME	WI	ENEA CMCCC	NIES IGES Secretariat <u>IGES/NIES</u> ENEA/CMCCC <u>Secretariat</u>	<u>UKERC</u> (hosting)	
CIREN ADEME	WI	ENEA CMCCC	Secretariat <u>IGES/NIES</u>	<u>UKERC</u>	Other research organisations
CIREN	WI	ENEA	Secretariat <u>NIES</u>	<u>UKERC</u>	(participants)





Acknowledgement

Considering the growing importance of scientific support to climate policy processes after the Paris Agreement, the current LCS-RNet steering group and government Focal Point members have leveraged various opportunities with concerned stakeholders to discuss the future of LCS-RNet, and having reviewed our past efforts and activities, we decided to strengthen the framework as a group of action-oriented researchers. This five-year plan is the culmination of discussions, and presents a concrete action plan for a future LCS-RNet.

To transition to a decarbonised society within the limited time remaining, the research community needs to not only provide scientific knowledge to stakeholders but also proactively take on the role of actual “change agent” in society. To do so, further mutual understanding with various stakeholders is indispensable. The intention of this five-year plan is for it to act as an intermediary in strengthening ties amongst stakeholders and actors.

A comparative study on long-term strategies and scenarios has already been launched among LCS-RNet member research institutes, which will lead collaboration among many similar projects all over the world. In addition, there have been proposals for further subjects for research. This five-year plan should incorporate new agendas necessary for upcoming policy processes, with updates made accordingly. In this regard, we earnestly hope to continue receiving support from those concerned.

This five-year plan is compiled by the LCS-RNet Secretariat, Dr. Shuzo Nishoika, Dr. Mikiko Kainuma, Ms. Tomoko Ishikawa and Ms. Michiko Inoue. Taking this opportunity, we would like to express our sincere appreciation to Japan’s Ministry of the Environment for its support of the above over the past eight years.

LCS-RNet Steering Group



Appendix: LCS-RNet in Brief – 2009-2016

What is LCS-RNet?

The International Research network for Low Carbon Society (LCSRNet) is an open community of researchers and research organisations contributing directly to policymaking and implementing processes, as well as like-minded relevant stakeholders, such as national and local policymakers, international organisations, business and financial entities and civil society, that together facilitate the formulation and implementation of science-based policies for low carbon development in the world.

How did it come about?

It began with a proposal from Japan at the Kobe G8 Environmental Ministers' Meeting (EMM) in 2008. The G7 EMM in Toyama, 2016 then reconfirmed the growing importance of the role of the science community and research network to support the Paris Agreement.

What are the distinguishing features & added value of LCS-RNet?

As a platform linking science with policy towards decarbonised societies, LCS-RNet has distinguishing characteristics as shown below, and offers additional value.

- Comprehensive research ability to promote the transition to decarbonised societies: LCS-RNet is a network of research institutes promoting solution-oriented, multilateral, cross-cutting research.
- Close cooperation with policymaking and implementation: LCS-RNet member researchers and research institutes have worked in close collaboration with government agencies in charge of climate policies in each country, and have the connections to translate inputs into policies.
- Collaboration with international activities: Each research institute has worked with international organisations such as IPCC, UNFCCC and UNEP, and conducted much international joint research, including DDPP. They have strong ties with international society.
- Knowledge accumulation for the transition to decarbonised societies: While operating as a community of like-minded researchers, LCS-RNet also shares important research directions by promoting close cooperation, collaboration and knowledge exchange, leads researchers and experts, takes initiatives for joint research, and accumulates knowledge for joint policy recommendations.

Who has been participating?

Currently, 16 research institutes in Japan, Germany, France, Italy and UK, in cooperation with Brazil, China, India and Korea, play a core steering role in the network, promoting cooperation and activities with research communities in developed and developing countries.



Fig. A1: LCS-RNet at a glance

Box. 1: How do member institutes contribute to national and international climate policies?

France



The **Centre International de Recherche sur l'environnement et le développement** (CIRED) was founded in 1973 in the wake of the Stockholm conference. CIRED has developed modelling systems exploring the relationships between economy, energy and climatic issues, including long-term models capturing the interactions between development patterns and the environment, and has also provided expertise to the French government (e.g., carbon tax project in 2009, elaboration of the French National Debate on energy transition international), international organisations (e.g., World Bank, IEA, OECD), NGOs and firms). CIRED has also been extensively involved in the Intergovernmental Panel on Climate Change (IPCC, group III) since AR2. There are currently four AR5 LAs at CIRED, which was involved in EUFP7 projects and in international modelling exercises (e.g., the Energy Modeling Forum (EMF) coordinated by Stanford University, the Innovative Modelling Comparison project (IAMC), Deep Decarbonisation Pathway project (DDPP), MAPS whose outcomes contributed to the 5th IPCC report). The research group at CIRED is composed of 27 researchers and 35 PhD students.

Germany



The **Wuppertal Institute for Climate Environment Energy** (WI) is one of the leading German think tanks working on the transition towards sustainability and Energiewende. With more than 100 scientists and over 40 doctoral students the institute delivers policy oriented research and consultancy, contributes to national climate and energy policy, and closely collaborates with stakeholders from all societal groups on all levels, local to international. Its scientists are members of various scientific networks including (lead-) authors for the IPCC.

Italy



The **Italian National Agency for New Technologies, Energy and Sustainable Economic Development** (ENEA) is the second largest Italian research organisation, with a staff of around 2,700 distributed in its nine research centers nationwide.

The Agency's activities are mainly focused on Energy Efficiency, Renewable Energy Sources, Nuclear Energy, Climate and the Environment, Safety and Health, New Technologies, and Electric System Research.

ENEA has been appointed by the Italian Ministry of the Environment and Protection of Land and Sea (MATTM) to represent Italy as a National Designated Entity (NDE) in the Climate Technology Center and Network – CTCN.

Japan



The **National Institute for Environmental Studies** (NIES) is a research institute covering all environment fields under the jurisdiction of the Ministry of the Environment, Japan. Its approx. 40 climate policy researchers with various expertise cover subjects ranging from GHG observation to policy recommendations. NIES is one of the leading institutes in overall climate policy research in Japan. AIM (Asia-Pacific Integrated Model) makes major contributions to the central environmental council of the Ministry of the Environment of Japan. Eight of its staff members participate in the IPCC, including two CLAs.

The **Institute for Global Environmental Strategies** (IGES) is a research institute supporting environmental policies mainly in Asia and was established under an initiative of the Japanese government. Its approx. 40 researchers work in the field of climate policies and resource policies. IGES has made recommendations on carbon tax, INDC, phase-out of coal-fired plants, and environmental finance. It serves as the Secretariat for the Low Carbon Asia Research Network (LoCARNet), which works with climate policy research institutes in ASEAN countries. IGES also hosts the IPCC inventory task force (TSU). Five researchers take part in the IPCC.

UK



The **UK Energy Research Centre** (UKERC) has worked closely with the UK government since its founding in 2004. Although UKERC is independent (funded by the UK's Research Councils), its research frequently informs the development of UK government policies, policy development within devolved administrations (particularly in Scotland), and broader debate on transition to low carbon energy systems. Examples include energy systems modeling for government energy policy White Papers and, most recently, modeling to inform government thinking about the 5th carbon budget (2028-32). UKERC also provides specific expertise in a wide range of areas, such as on the costs and impacts of intermittent generation, energy efficiency policy, and the future role of natural gas. Internationally, UKERC leads UK participation in the European Energy Research Alliance; and UKERC researchers contribute regularly to IPCC assessments.



LCS-RNet Footprints:

First phase of the network since 2009

LCS-RNet has been promoting knowledge exchange of climate policies amongst developed countries through annual meetings, conducting research on common agendas, deploying outputs, making policy proposals, and reflecting policies in each country. Discussions at annual meetings are compiled into synthesis reports and special issues of LCS-RNet reports are reported to each country and related international parties including UNFCCC/COP, academia and policy communities, as well as reflected in policies through researchers in each country.

Second phase from 2014 towards Paris:

In line with drastic changes in global climate policies, and to generate concrete policy proposals after COP21 as a turning point, annual meetings have focused on critical agendas such as energy systems, cities and land-use, international cooperation with developing countries, and, as a major topic, climate finance, which bridged the three topics above. Then, at the 7th annual meeting in Paris, we coalesced our discussions from past annual meetings into the LCS-RNet position statement, "COP21: A moment of truth for climate and sustainable development" published prior to COP21. While members of the LCS-RNet have provided their expertise for international climate negotiations since the network's establishment in 2008, this statement represented an especially significant contribution.

What was the core to the network's position statement at COP21?

The core assertions of our network's position statement, "COP21: A moment of truth for climate and sustainable development", are: that the policy shift toward the 2 degree target of the Cancun Agreements represents a major global and historical turning point; that "carbon pricing" to promote investment in the future must be a common policy and is required to lead the world in this direction, taking into account that the key to conversion lies both in energy conservation and conversion to non-fossil fuel energy systems, as well as the low-carbon development of cities and developing countries where over 70% of the population will be concentrated; and that 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 move on to a sharing of responsibilities at the actual 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 to boost the stagnating global economy.

What was the impact of the position statement?

Based on forward-looking integrated research on shifting to low-carbon societies carried out 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 of 213 experts and scientists (amongst them 71 authors, chairs and co-chairs of the IPCC working group III, top level senior development economists including a Nobel Laureate and five former ministers) from 47 countries demanding an active climate policy underpinned by strong instruments. The objective was to demonstrate the possibility of scientists from different disciplines, cultures, and countries at different development stages coming to a common consensus on the conditions for triggering climate action in the current economic context. The statement was submitted

to the Government of France and received and discussed by wide audiences at COP21 side events held at both the EU and France pavilions. In addition to the points set forth in the statement, including “conversion of economies based on ‘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 development 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”, as well as the necessity of linking measures to new economic growth based on actual economies, were advocated.

After Paris: inciting “Action” for transformation to a decarbonised future

With the remarkable success of COP21 the world took a great leap forward to “action” for realising low carbon societies. This has been reflected by the discussion of “How to achieve long-term transitions towards full decarbonisation”, held at the 8th LCS-RNet annual meeting in Wuppertal, 2017. Key issues in the discussions were: a) to tackle any future anticipated non-linearities and disruptive interferences with decarbonisation policies, b) to match strategies for economic and wealth development with the global investment programme of energy transition, climate mitigation and adaptation, c) to align these strategies with the overall sustainable development goals with focus on cities as well as basic industries as major arenas, and d) the increasingly important role science has to play in providing well-founded solutions and sound strategies for action.

We are now entering a new phase of “Action”!



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