

A Low-Carbon Asia: From Malaysia to Asia

Dialogues between Policy-makers and Researchers:
Towards Implementation

Synthesis Report

-Key findings from the dialogue-

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Symposium on Low Carbon Asia Research Projects

Organiser: Iskandar Malaysia Regional Authority, Universiti Teknologi Malaysia (UTM)-Centre for Innovative Planning and Development, IGES/ LCS-RNet Secretariat, Kyoto University and NIES

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Key Findings

Part 1. Current state of low-carbon policy and research in Asia: From the national and sub-national levels to a regional network

1. Asia is making progress in its low-carbon policies.

An increasing number of countries in Asia are taking forward-looking policy initiatives to reduce global GHG emissions by expanding research and establishing low-carbon action plans and mitigation scenarios at the national, regional and also municipal levels.

2. Research and other collective activities of researchers in different fields should be deepened and integrated to enable policies that are well-grounded in scientific evidence and findings.

Collaborative research and capacity building are important for nations to develop their own modelling tools, so that each nation can arrive at its own views and conduct decision-making with greater autonomy. In this way, each nation will be able to formulate and develop its own sustainable development path. Governments must have strong commitments to achieving Low-Carbon Society (LCS) in order to bring low-carbon policies into implementation.

- Governments perceive LCS as opportunities for technology transfer, international finance, and capacity building to support their sustainable development.
- Governments are showing strong policy signals towards LCS.
- Governments are willing to pursue policy-making firmly grounded in science.

3. Asia has an important role to play in contributing toward the establishment of global low-carbon societies.

It is time for Asian countries to show the existence of Asian climate change related activities and progress by integrating Asia's knowledge and by sending messages to international climate change communities. Regional cooperation initiatives such as those currently underway in Iskandar Malaysia can provide ideas that enhance research collaboration within a nation.

4. Dialogues between policy-makers and researchers should be conducted continually.

Despite progress in technological developments, barriers for moving into the next stage of low-carbon development exist in the areas of implementation and application of these developments within the policy context. Continual and ongoing dialogues between policy-makers and researchers are needed in order for them to understand current constraints and barriers while also coming to hold views towards LCS in common. A mechanism should be constructed by which the sharing of information and also discussions between policy-makers and researchers contribute to policy planning.

5. Coordination and collaboration at the national and sub-national levels, and beyond that, at the regional level are the keys to strengthening ownership of knowledge and to accelerate the speed of development to foster the realisation of low-carbon societies in Asia.

Collaboration and networking of researchers at both the national and sub-national levels, as well as at the regional level, are important in bringing research findings to realisation and implementing local low-carbon activities on the ground. Sharing a common understanding of the country's potential for, and achievements regarding, transitioning towards LCS is a key element within national progress towards realising LCS. These national collaborative activities can be enhanced by sharing experiences and knowledge across the countries in the Asian region.

- It is necessary to have inter-ministerial coordination of LCS policies (e.g., land-use policies)
- Cooperation between policy-makers and research communities is imperative for low-carbon development
- The sharing of experiences among Asian countries at the national and sub-national levels is valuable in terms of the lessons learnt in different countries.

6. International aid agencies and international organisations are ready to cooperate toward low-carbon research and provide support to build up a platform for researchers to exchange information and lessons learned.

Different funding agencies have different roles in promoting scientific research by supporting researchers as they integrate their research findings into practical policies and advance effective research to enable a nation to find its own way of taking actions and achieving a low-carbon society.

Part 2. Asian features of LCS: Research needs to implement LCS on the ground

7. Early action through initiatives at the sub-national level is important in order to establish low-carbon cities and/or low-carbon regions.

Urbanisation has been proceeding rapidly. Cities can take the lead in accelerating the achievement of low-carbon societies. However, in light of the speed of urbanisation, in order not to lock in a high carbon future, early actions for low-carbon cities and regional planning are imperative. Climate policies and actions in cities or at the local level can be developed to achieve low-carbon societies. Therefore, low-carbon cities or regions will be key in implementing low-carbon development on the ground.

8. In Asia, low-carbon planning is needed not only in the energy sector but also in the land use and forestry sectors, which are important policy areas, especially in rural areas. These specific issues and experiences can be mutually shared amongst Asian countries over geographical boundaries.

The land use composition and energy consumption patterns in Asian countries may differ significantly between rural and urban areas. Different strategies are needed for rural and urban areas when targeting sectors to combat climate change. Energy efficiency and public transportation should be developed in urban areas while land use change policy should be the focus in rural areas.

- Major emission sources/target areas are energy, agriculture and forestry, and transportation.

9. Technology transfer should be appropriate to the capacity and the environment within both a national and local context, and transferred technology needs to be localised.

Technology development and deployment patterns as well as social values are different in each country and even within countries. The differences and uniqueness can be realised and enhanced when their views and values are shared and exchanged across countries and regional boundaries. At the same time, changes to the infrastructure pattern that facilitate or form a basis for the realisation of an LCS are important.

- Policies and target areas are necessarily varied and specific to national or local circumstances, due to differences in stages of development and in geopolitical and geographical conditions.
- No common generalised approach/policy is applicable to all countries or local areas.
- Learning from good practices originating in other countries is important when capacity is limited.

10. Leapfrogging can occur from the two dimensions; (i) technological innovation and (ii) Asia's traditional social values in line with sustainable development.

Technology transfer and technical know-how can support the localisation of technologies. On the other hand, the utilisation of traditional wisdom for the sustainable utilisation of, and coexistence with, natural resources, such as in Thailand's "sufficiency economy" approach, can be key within a nation's paradigm shift, as it provides a unique approach contributing to GHG emissions reductions. For example, mitigation within the forestry sector depends on social systems as well as local voluntary actions with social values and views of ecosystems. Therefore, the knowledge of local people in adaptation and natural resource management are important in designing mitigation strategies.

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Preface

If Asia develops in a conventional manner as a society characterized by technologies having high energy consumption, it is clear that it will be impossible to stabilise the global climate, while simultaneously causing substantial harm to a great number of people in this region. On the other hand, the Asian region has enough potential to move forward with low-carbon development, and there are a number of ongoing favourable conditions supporting this potential. Therefore, if Asian countries introduce innovative technologies developing rapidly and “leapfrog” in their development, they will be able to advance along the pathway to low-carbon development and lead the way to a low-carbon society at the global level.

Each country in the Asian region is currently working to develop a plan towards low-carbon development in terms of nationally appropriate mitigation actions (NAMAs). There are numerous policy steps involved, and the formulation of such plans requires scientific knowledge spanning a broad spectrum of fields. Policies for low-carbon development are important decisions determining countries’ future potential and direction, and thus each country has the right to self-determination in formulating them. Therefore, countries must have their own, robust scientific research foundation.

In light of the great importance that Asia has had in various areas within global climate policies, Universiti Teknologi Malaysia (UTM), Iskandar Regional Development Authority (IRDA), and the International Research Network for Low Carbon Societies (LCS-RNet) jointly organised a Symposium on Low-Carbon Asia Research Projects on 4 July 2011 in Johor Bahru, Malaysia, together with Kyoto University, Okayama University, the National Institute for Environmental Studies (NIES) and the Science and the Technology Research Partnership for Sustainable Development (SATREPS) supported by Japan Science and Technology Agency (JST) and Japan International Cooperation Agency (JICA). Thanks to these organisations, this symposium was very fruitful, with 120 participants from Asian countries and the Asian Development Bank (ADB).

The symposium shared the importance of strengthening the scientific base for low-carbon development policies in the region by proactively exchanging knowledge among policy makers and researchers, and proposed launching a network which aims to help the Asian region strengthen its fundamental and sustained capacity in formulating science-based policies for low-carbon development. Also, the symposium decided to hold a follow-up workshop sometime in October or November 2011, preliminary to the launch of this proposal.

Taking this opportunity, we would like to express our gratitude to all of the participants at the symposium for their contributions. I hope that we can meet again at the follow-up workshop to be held in this autumn.

In addition, we also would like to give our appreciation to the Ministry of the Environment of Japan for its generous support through the LCS-RNet Secretariat.

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Synthesis of Findings

Part 1.

Current state of low-carbon policy and research in Asia: From the national and sub-national levels to a regional network

1. Asia is making progress in its low-carbon policies.

Malaysia has numerous examples of efforts at the national, regional and local levels to foster low-carbon cities.

Malaysia is working towards a voluntary reduction target of up to 40% in terms of energy intensity of GDP by 2020, compared to 2005 levels. These efforts are taking place against a backdrop of increasing urbanisation and governments working to secure access to electricity, water, and education. Malaysia's national planning framework known as "Economic Transformation Plan" includes placing importance on energy efficiency standards, laws and regulations in the area of mitigation policy, ecosystem services for emissions reductions, and green technology policy even while enhancing economic growth. Malaysia also utilises "green cities" as showcases for low-carbon urban development.

There are also numerous examples of efforts underway in Cambodia, China, Indonesia, Japan, and Thailand for translating carbon reduction goals into carbon reduction achievements. The exchange of information and ideas among Asian countries is expected to provide relevant ideas for countries to improve their environmental performance and also provide capacity building from the absorption of knowledge and lessons learned.

2. Research and other collective activities of researchers in different fields should be deepened and integrated to enable policies that are well-grounded in scientific evidence and findings.

Creating a low-carbon society requires the mobilisation of a diversity of expertise from across a broad spectrum of the scientific community.

This is true from the earliest stages in the process, as emission and development pathways need to

be identified while the mechanisms, conditions, and drivers of societal transformation have to be understood.

At the same time, many governments are taking an active interest in exploring the potential for a low-carbon society (LCS) grounded firmly in research, and some are already showing strong policy signals towards fostering such a society, including in such areas as energy and land use, institutional reforms (social systems, regulations, etc.), security (social security, food security, energy security, etc.), and co-benefits areas such as reduction of air pollution and improvements in health.

One important step towards the creation of a future LCS is the development of "scenarios" in which views of future societies are laid out and the modalities associated with the path to future development are identified. Ways to transform society into a low-carbon version are then deduced on the basis of these scenarios. The participation of experts from across a broad spectrum of expertise is what will enable the elucidation of roadmaps for technological transformation, roadmaps for innovative policy actions, and drivers of behavioural change among stakeholders. Thus a key challenge is how to collect and then synthesise such a diversity of expertise. Social networks have already demonstrated substantial power in this regard.

In fact, there are already a number of scientific works on low-carbon development strategies in the region that can assist policy-makers in developing strategies toward low-carbon development. However, these methods and studies are still not being used effectively. Therefore, a regional network on a low-carbon society would be useful for sharing multiple kinds of modelling work and methodologies in order to facilitate policy makers' ability to develop low-carbon development strategies.

A policy-relevant knowledge sharing network of scientists can fill in a gap between climate change

policy and scientific evidence for GHG mitigation activities. A network of scientists who are independent of their governments and have expertise in a wide diversity of fields can enhance activities to achieve progress in both north-north and north-south cooperation and work to facilitate south-south cooperation. In this way a knowledge-sharing network has the potential to serve as a key means for deepening and integrating the activities of researchers across a broad spectrum of fields in countries at different stages of development.

Modelling training exercises and scenario-making and real implementation in city planning level have been applied in the Iskandar Malaysia region using the Asia-Pacific Integrated Model (AIM), with support for the strengthening of international science and technology (S&T) cooperation by means of a partnership of an aid agency and academia on the Japanese side and a partnership of a regional government authority and a local university on the Malaysian side. Simultaneously, sustainable research activities in developing countries' research institutes are being fostered. This aims for its research results to be reflected in policies around the region.

Meanwhile, such a knowledge-sharing network with strong support from national governments seeks to contribute not only to national and regional policy-making but also the global policy-making process, such as international policy-making processes on climate change, including notably the G8 process, through its research outcomes and recommendations. A potential LCS "Asia League," proposed as a means to achieve low-carbon development in Asia, would also aim to go beyond even the national and regional levels to influence policies at the global level.

3. Asia has a role to play within contributions toward the establishment of global low-carbon societies.

Most of Asia, notably developing countries, have much to contribute in terms of reducing global greenhouse gas emissions, in that they still have the ability to avoid "locking in" high carbon modalities, as noted above.

At the same time, Asia is noted as being important for the world in that it faces a series of challenges and opportunities simultaneously. Energy and food security are critical areas, and instability in these areas

has the potential to contribute to economic and social instability.

The establishment of an LCS "Asia League" as one means of fulfilling the promise is seen by some researchers as critical in that it would identify areas of Asian uniqueness and then conduct information exchange and research cooperation, leading to demonstrations and subsequent changes in policy, followed by information exchange and collaboration at the regional level, ultimately enabling contributions to the international policy-making process. Interactions under such an arrangement could contribute to international collective actions, including in terms of climate action, at the global level.

Many local or regional initiatives already underway, such as those in Malaysia's efforts to foster low-carbon cities, are already contributing new approaches and solutions to the need to create synergies between low-carbon development and overall development priorities, where with the strong commitment of the regional authority to implement a low-carbon city model in collaborating with scientific inputs and evidence with local universities. Furthermore, regional cooperation initiatives such as in Iskandar Malaysia can provide ideas that enhance research collaboration within a nation. These initiatives also take as a goal the translation of research results into policy development, and thus there is great potential for such efforts to affect policy-making at the national and ultimately the regional and global levels. As an initiative already being pursued in concrete terms, the Iskandar Regional Development Authority (IRDA) is working with researchers to reduce Iskandar Malaysia's carbon emissions by up to 50% by 2025 and then transfer research results into policy at a broader scale.

In order to enable low-carbon societies of the future to pursue strategies for future collaboration and the involvement of different stakeholders, interrelationships should be fostered now within various areas, such as among green networks and in the area of technology development.

4. Dialogues between policy-makers and researchers should be conducted continually.

In exploring the path towards a low-carbon society, one point that has become clear is that both policy-makers and scientific communities have common questions in how to go about developing an LCS.

Policy-makers and researchers should engage in dialogue sessions through which policy-makers could learn in a practical manner about LCS measures for implementation, grounded in evidence-based research. There is a growing and urgent need for scientific evidence and climate change knowledge by policy-makers who have realised the need for action plans that can be in fact feasible on the ground.

Thailand and Indonesia have started to consider profiling and consolidating scientific findings by academia and researchers as national assets that can help transition national plans into actual implementation of mitigation activities. Policy-makers in Malaysia, Indonesia and Thailand request more realistic roadmaps and manageable tools from each country's domestic local research institutions, which will apply and develop these within actual LCS processes, thereby collaborating towards scenario development and roadmap formulation at the national level.

5. Coordination and collaboration at the national and sub-national levels, and beyond that, at the regional level are the keys to strengthening ownership of knowledge and to accelerate the speed of development to foster the realisation of low-carbon societies in Asia.

In fostering low-carbon societies, it is important that the results of scientific analysis be translated not only to national policy but also to local programs.

This is particularly true in Asia, where the degree of development is disparate not only among countries but also often within them. Each country has its own strengths amongst its policies and measures in various sectors. Therefore, there is a need within each country to learn and experience and collaborate among researchers. Regional networking will be more effective if it is conducted through showcases and networking conducted at the national level.

Furthermore, it is important that there be a common understanding of the intended path forward to LCS between national governments in their policy-making and local governments in their implementation of activities on the ground. Among other issues, even if there is awareness of the desirability of LCS at the national level, there is almost no awareness in many

small regions and cities, yet success is dependent on participation by local governments and people. Low-carbon knowledge sharing activities started in Asia is working to promote understanding about LCS through dialogues not only between researchers and policy-makers but also with business, citizens, and other such stakeholders at the local level in order to foster greater awareness and promote implementation of projects on the ground.

Moreover, insofar as an LCS impact, and is impacted by, policies and measures in every aspect of society, it is important that ministries, as well as decision-making and implementing bodies at the local level, collaborate and coordinate with each other. LCS should not be considered simply a matter of "the environment" but rather as something related to such disparate areas as industrial production, zoning and urban planning, transport, building standards, energy efficiency, and education, among others. Success in creating LCS will be difficult without synergies with development priorities. Consistency and continuity are important regardless of whether the efforts employ top-down or bottom-up approaches.

Furthermore, this is true at both the national level and the regional level, and thus research methods and findings should be shared with other researchers and also policy-makers at not only the national level but also the regional level.

6. International aid agencies and international organisations are ready to cooperate toward low-carbon research and provide support to build up a platform for researchers to exchange information and lessons learned.

It has been noted that the interests and motivations for modelling analyses have been growing in Asian countries. The needs of knowledge sharing through these tools are recognised amongst international aid agencies and other international organisations.

In particular, the Asian Development Bank launched a Regional Review of the Economics of Climate Change in Southeast Asia, a "Stern Review"-type analysis. The success of this project addressing Southeast Asia gave rise to interest in conducting more sub-regional studies, and these are now underway in all other sub-regions of Asia, namely the Northeast, South, Central & West, and Pacific sub-regions. Moreover, collaborative works between researchers in developed

countries and developing countries has enhanced the knowledge-sharing for mutual understandings to develop the low carbon activities as a case of Iskandar Malaysia and JST-JICA Low-Carbon Project.

Another response to the success of the Southeast Asia project was that Southeast Asian countries requested further ADB assistance for in-depth country-level modelling and capacity building exercises. ADB has responded by conducting Technical Assistance on strengthening planning capacity for low-carbon growth in developing Asia. This supports low-carbon planning, provides better access to decision-support tools and planning frameworks, and strengthens the capacity of agencies and institutions to utilise these

and other tools, thereby enabling countries to find their own way of taking actions and achieving a low-carbon society, in line with their particular circumstances.

If collaboration were established between the funding agencies' technical assistance and international network such as the LCS-RNet and GGGI, a platform for researchers to exchange information and lessons learned with each other and promote north-south and south-south cooperation. This network should incorporate mechanisms to work with policy-makers, with importance placed on the involvement of development planning agencies and major ministries other than the Ministries of the Environment, such as Ministries of Energy.

Part 2

Asian features of LCS: Research needs to implement LCS on the ground

7. Early action through initiatives at the sub-national level is important in order to establish low-carbon cities and/or low-carbon regions.

Asian countries need to take early actions to avoid locking in high carbon infrastructures and energy systems in the process of development.

Urbanisation merits special attention within the Asian context. Asia is urbanising rapidly, and insofar as Asia's share of both global population and global GDP are expected to exceed 50% by 2020, the transformation of Asian urbanisation towards more low-carbon modalities will contribute significantly to improvements in the economies, natural systems, and quality of life around Asia and by extension the world.

It is critically important to recognise that approaches must be tailor-made for each low-carbon city or low-carbon region; blanket approaches achieve only limited impact. Among the cities and regions that have developed local scenarios thus far are Iskandar, Malaysia; Kyoto and Shiga, Japan; Jilin, China; and Ahmedabad, India.

Collaboration within Asia is needed to promote LCS and avoid locking in high carbon modalities. It is useful to follow a bottom-up approach that starts from the practical or "hands on" level, then advances to the national level and ultimately to the

regional level. For example, Malaysia's key economic development corridors, which constitute one basis of its development approach, have already introduced compact city components, and in Iskandar Malaysia in particular, a modelling process is in use to help achieve the vision of economic growth to create a strong and sustainable metropolis of international standing. This will then feed into policy-making at the national level. It should be noted that in the case of Iskandar Malaysia, an approach of enabling policy-makers and local authorities to incorporate stakeholders' inputs into town-making exercises has been shown to engender local stakeholders' commitments to these activities. This sense of commitment by local stakeholders, along with a "low-carbon mindset" or low-carbon behaviour, will contribute to the success of initiatives at the sub-national level.

8. In Asia, low-carbon planning is needed not only in the energy sector but also in the land use and forestry sectors, which are important policy areas, especially in rural areas. These specific issues and experiences can be mutually shared amongst Asian countries over geographical boundaries.

Asian countries can learn from each other through their progresses and development process of research findings and exercises.

For example, Asian countries can learn from Japanese experiences of how Japanese low-carbon scenario studies have developed over time (such as under the Japan LCS Project undertaken from FY2004 to FY2008) and how they have been extended to the Asian model (such as under the Asia LCS Project now underway), not only in identifying points in common in pursuing LCS across various countries, but also in highlighting points which differ.

Specifically, it has come to be recognised that common issues exist within “urban” and “rural” groupings, regardless of borders. It has become equally clear that urban and rural areas require different actions and strategies to reduce GHG emissions. A comparison of emissions sources in urban versus rural areas in developing countries indicates that rural areas have emissions arising most significantly from LULUCF, while some 40% of urban area emissions have their source in fossil fuels. This implies a need for different strategies, focused on energy efficiency and public transportation in urban areas and land use change policy in rural areas.

9. Technology transfer should be appropriate to the capacity and the environment within both a national and local context, and transferred technology needs to be localised.

Asia is home to the most diverse range of national circumstances of any region in the world.

In undertaking technology transfer, particular care must be taken to ensuring a “good fit” with the needs and circumstances of the recipient country by adjusting the national and local environment and human capacity and level of technology capacity. Accelerating the transfer of technology through south-south cooperation, as well as collaboration between ASEAN countries and other Asian countries like Japan and China, can play a key role in strengthening technology development and thereby promote energy efficiency and enhance renewable energy supply systems.

As one example of diversity in the region, key energy challenges range from increasing power generation capacity (Vietnam) to diversification to ensure energy security (Malaysia) to rural electrification (Myanmar) to increasing hydropower to earn export revenue (Lao PDR). The policies within such countries will necessarily be varied and country-specific, and in the

same way, technology transfer needs are also highly diverse. Simplified and manageable technology that the local people will be able to maintain over the long term should be identified and applied, together with support via ongoing capacity building and training.

Actively fostering north-north and north-south cooperation, Japan and international development organisations such as the ADB and the World Bank are now actively seeking to facilitate south-south cooperation, such as through a forum. Such north-south and south-south cooperation can facilitate not only technology transfer but also knowledge transfer. Through networking and the sharing of experiences of successful LCS efforts to date, it is expected that countries will find it easier in the future to identify types of technology that would be applicable to their own set of circumstances, thereby accelerating the transfer of well-suited technologies.

In conducting technology transfer, the importance of south-south cooperation should be fully recognised. In addition, there is a need for the localisation of the technologies that are transferred to match the specific circumstances that characterise the recipient locality.

10. Leapfrogging can occur from the two dimensions; (i) technological innovation and (ii) Asia’s traditional social values in line with sustainable development.

“Leapfrogging” to a low-carbon society within Asia can be realised by making use of unique technology development and Asia’s many traditional social values that are very much in line with principles of sustainable development.

Examples of unique technologies include wind farms in China, solar parks and biogas in India, green buildings in Singapore, biodiesel in Malaysia, bioethanol in Thailand, peatland conservation in Indonesia, and integrated farmland in the Philippines. Societal aspects, in which local wisdom is applied to achieve a paradigm shift, include the “sufficiency carbon economy” and a mindset of coexistence with nature, emphasising balance and sustainability. Thus, sharing experiences should follow a bottom-up approach that begins at the practical or local levels, later advancing to the national and subsequently the regional levels.

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SO_1	<i>JST: Science and Technology Research Partnership for Sustainable Development (SATREPS)</i> Kenji Yamaji, Japan Science and Technology Agency (JST), Program Officer - Energy Systems for Low-Carbon Society, Japan
SO_2	<i>Iskandar Regional Development Authority (IRDA)</i> Dato Benjamin Hj Hasbie, IRDA, Malaysia
SO_3	<i>Universiti Teknologi Malaysia (UTM)</i> Md Nor Musa, UTM, Malaysia
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In this region, Japan has held nine GHG inventory workshops since 2004 as well as 15 training workshops on the Asia-Pacific Integrated Assessment Model (AIM) for policy making since 1997, supported a great deal of research and studies in this region, and promoted research collaboration through JICA/JST/SATREPS. Taking this opportunity, I would like to give my sincere thanks to Kyoto University, Okayama University, NIES, and SATREPS, all of which were co-organisers of the symposium. I sincerely hope that we will continue our collaboration moving toward the achievement of low-carbon development in Asia.

The objectives of the symposium were to share common research agendas on low-carbon research in the Asian region, provide opportunities for knowledge sharing through an independent LCS research network, and create horizontal ties within Asia in a way similar to the annual meetings held in G8 countries. In addition, the symposium appealed to people all over the world regarding Asia's activities regarding the activities underway in Asia that contribute strongly to research supporting the policy process, while also developing a plan for potential future opportunities.

Part 1. Current state of low-carbon policy and research in Asia: From the national and sub-national levels to a regional network

Part 2. Asian features of LCS: Research needs to implement LCS on the ground

Finally, I would like to take this opportunity to express our profound gratitude to all speakers and participants for their contributions to the Symposium. I would also like to add our sincere appreciation to IRDA and UTM for their guidance and support in organising the symposium and for their hospitality in Malaysia. Special thanks are accorded to Mr. Boyd Dionysius Joeman, Planning & Compliance Division, IRDA, Malaysia and Prof. Ho Chin Siong, UTM-Centre for Innovative Planning and Development for their guidance in planning this workshop and for their considerable efforts in coordinating this meeting.



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Title: Towards Sustainable Low-Carbon Development and Green Growth in Indonesia and Asia-Linking Research and Policy-

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