

## IGES Submission to ADP Workstream 2

### **Technical inputs on the Technical Expert Meeting on Urban Environment**

Institute for Global Environmental Strategies (IGES), 28 May 2014

IGES is pleased to submit this document pursuant to the request for submissions on opportunities for actions with high mitigation potential, including those with adaptation and sustainable co-benefits, as referred to in decision 1/CP.19, “Further Advancing the Durban Platform,” paragraph 5(a).

This submission<sup>1</sup> aims to provide technical inputs on the promotion of urban environment with the view to raising the level of mitigation ambition by 2020 and beyond, which is based upon the discussion at the International Research Network for Low Carbon Societies (LCS-RNet) and the Low Carbon Asia Research Network (LoCARNet)<sup>2</sup>. LCS-RNet and LoCARNet is a practical platform of researchers/research organisations that are making close contributions to individual countries’ low-carbon policy-making processes. The secretariats of both the LCS-RNet and LoCARNet are located in IGES<sup>3</sup>. This report covers the following issues on urban environment; role of city, urban policy planning, practices and implementations and challenges, technology and dissemination, stakeholder involvement, capacity development and recommendations for a low carbon urban environment.

#### **Summary**

- Low carbon development in cities involves a combination of hard options such as changes in infrastructure, waste management, energy system and soft options such as raising awareness and behaviour changes. Therefore, sound research and knowledge should form the basis for the planning and development of cities. Community engagement is also important for city planning and decision-making. Scientific evidence derived through research helps in forming consensus among stakeholders. It is essential to supplement national policies and plans with local actions. Therefore, the transition to low carbon society should begin at the local level. Barriers such as those related to pricing policy, incentives, access to financing, land tenure and access, and knowledge on low carbon farming also hinder the upscaling and the improvement of efforts to build a low carbon society
- 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 in use to help achieve the vision of economic growth to create a strong and sustainable metropolis of international standing<sup>4</sup>. This will then feed into policy-making at the national level. It should be noted that in the case

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<sup>1</sup> [http://unfccc.int/documentation/submissions\\_from\\_observers/items/7479.php](http://unfccc.int/documentation/submissions_from_observers/items/7479.php)

<sup>2</sup> The material list is attached in the appendix of the paper

<sup>3</sup> For further information on LCS-RNet and LoCARNet: <http://lcs-rnet.org>

<sup>4</sup> As one of is a large-scale computer simulation model, the Asian Pacific Integrated Model (AIM) is used for Low Carbon Society (LCS) scenario-making in the Iskandar Malaysia region. Currently Prof. Dr. Ho Chin Siong in Universiti Teknologi Malaysia (UTM) who is expertise includes Town Planning and Low Carbon City is a project manager of the LCS scenario-making project.

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 subnational level

- Accelerated innovation, cost reduction, appropriate arrangements for risk-sharing and the enhancement of local benefits will be key factors to obtain public acceptance and successful deployment and installation of renewable energy. The deep transformation of energy demand in electricity and heat will be generated through the transition to a low carbon society will also help to build a more resilient energy system. The transition will require the following elements: a diverse and decentralised energy supply including the development of more flexible, locally-sited renewables; the avoidance of high levels of dependence on specific types of power generation; the development of smart grids; and greater regional interconnections. The latter will facilitate the better integration and more efficient use of intermittent low carbon electricity and allow the export of low carbon energy, especially to countries with higher shares of electricity in final demand

#### **Role of the Cities for climate change mitigation**

- The roles of regional and local authorities are of paramount importance to accelerating a transition to a low carbon society. Local level authorities have more direct contact with constituencies, making them better positioned to build consensus on climate mitigation action and to take meaningful actions. Cities, provinces and regions are increasingly getting involved in climate change issues.
- GHG emission reductions can be managed by addressing crosscutting and practical issues at different geographical scales such as at the city or local levels as well as at a sector scale in energy, agriculture, forest and land use change, among others. Cities often serve as good demonstration sites for implementing innovative local actions while sectors play a principal role in defining technologies and approaches to be used in reducing GHG emissions.
- Cities can offer to implement measures addressing structural and cross-sectoral issues with high mitigation potentials while introducing key countermeasures locally. Cities can improve the quality of life of residents and offer places which make it easy for people to live, work and play. Low-carbon cities will be a main engine as well as a solution for improving liveability and sustainability within future urban development.
- Cities will play a major role in shaping the transition to a low-carbon society. Low-carbon society impacts citizens, both where and how they live. Cities are crucial actors since they can directly influence the planning of key issues such as traffic, urban land-use, buildings, and waste management. Already, several cities have begun to autonomously act on self-determined targets that support a low-carbon society. For instance, local governments and municipalities in cities have set med- or long-term mitigation targets, identified demand-side and supply-side options, made concrete action plans, and created governance mechanisms and institutions to involve relevant stakeholders.
- The role of cities, including the influence of those constituencies, needs to be mainstreamed in national

and international level climate policy. However, as there could be many organisations representing the municipal level, certain mechanisms for effective coordination would be useful in this process.

### **Urban policy planning towards a low carbon city development**

- Many cities have recognized that climate change and its consequences are real and, in response, have developed low carbon blueprints by identifying priority areas and drawing up implementation plans. Recent trends show that the focus has shifted from a mitigation-centric to a more linked approach, integrating the economy, environment and climate resilience. There exist several opportunities in the form of synergistic solutions that could help achieve low carbon benefits as well as local sustainability. These include heat recovery and use, transit-oriented development, smart grids, waste management and out of boundary emissions.
- At the regional level, the development of climate change mitigation and adaptation plans and the establishment of GHG reduction targets, accompanied by the use of complex carbon market mechanisms, are already playing a fundamental role in building knowledge (sometimes consensus) and capabilities for subsequent national and global initiatives. These regional initiatives exhibit great potential in stimulating clean technology development and deployment, creating new green jobs, and developing needed green skills.
- The most comprehensive subnational plans present a sectoral and integrative approach that distinctly treats the particularities of different key areas like energy efficiency and renewable energy, transportation, buildings, agriculture, waste management, public engagement and industry.
- A credible GHG inventory is essential for cities. It serves as an important tool for measuring carbon emissions, identifying reduction opportunities, monitoring progress, benchmarking performance, and providing a basis on which to leverage finance. However there are issues of inconsistency, unclear boundary definition, incompleteness, double counting, and poor transparency.
- It is critically important to recognize 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

### **Practices, implementations and challenges in transition to a low carbon city development**

- Several sectoral initiatives are underway in cities, including in the transport, building, industry, energy and waste sectors. Significant decarbonization will be required beyond these interventions and therefore scaling up these interventions will remain a challenge. It will be necessary for more and more cities to transition to low carbon.
- Small efforts such as bike sharing systems in many cities around the world while at first appearing insignificant can service as a means to encourage behavioural change toward more sustainable lifestyles.
- Tailored policy packages need to take account of both variations between countries driving from cultural attitudes towards the use of resources, and variations within countries that reflect local specificities and diverse market, cultural and social conditions. For example, the success of Tokyo's energy conservation

program in the building sector cannot easily be transferred to other Japanese cities because Tokyo is the de facto centre of business and industry. This discourages businesses from moving to other cities and enhances the success of the program, thus avoiding market leakage.

- It is important to consider various co-benefits in addition to GHG reductions by looking at local issues and how people can benefit with regard to improvements in those areas. People are more motivated to act if they see changes in their own lives. One challenge lies in quantifying the co-benefits. Japan is committed to shifting Asian cities to LCS through the ‘future city’ initiative, which assists developing countries in building sustainable cities through showcasing successful cities and replicating these results into new, developing cities. Thus, mutual learning can play a key role in developing co-benefits and mainstream climate policy within the national development plan.
- Household cannot refurbish their houses, they want to recoup their upfront costs within three to five years and lower income families do not necessarily have access to low interest finance. The shortage of skilled labour is another obstacle. Programs that are designed and delivered locally to take account of specific conditions have the best chance of success in overcoming these obstacles.

#### **Low carbon technology and dissemination in local context**

- Early support for low-carbon options (e.g. energy efficiency, plug-in hybrids, and enhanced energy storage) would help to avoid lock-in. This support needs to pay due attention to the timing of interventions from R&D through to market deployment. Local specificities, the level of maturity of technologies, and social acceptance (including the availability of adequate human resources) also need to be taken into account.
- Decentralised energy systems through biomass can be developed based on local production in more isolated areas. This can be integrated to a greater or lesser degree with smart grid networks. This promising option has given rise to a range of initiatives delivering electricity to local areas through off-grid energy systems or by bio-and other types of renewable energy supply. But competition between biomass energy, carbon sequestration and food production may create tensions over land-use. This is why well-coordinated land use policies covering agriculture and energy policies at the local, national and regional levels are needed.

#### **Stakeholder involvement for policy practices in local level**

- Collective actions are necessary. One example of this would incorporate spatial development, sectorial development, local green businesses and local community participation
- Community engagement remains a seldom-used but potentially influential tool for change; however, only a few local strategic plans have been the result of public stakeholder consultations. Among the main challenges of local action that remain are the lack of coordination with national governments and the lack of local financial resources.
- Cities are driven by their communities and therefore, local participation (include private sectors) is the most important factor in bringing about low carbon development. High costs are associated with low carbon projects, necessitating a search for new policies and business models. The business community

has an important role to play. Opportunities exist for the private sector to tap business opportunities in emissions reductions. Private companies are taking the initiative to develop benchmarks for new low carbon initiatives such as smart community infrastructures. The implementation of smart infrastructure could be an effective way to solve environmental issues associated with urbanization and there are expectations towards cities to be both the developers and the users of these standards.

### **Capacity development of stakeholders in local level to enhance their engagement in low carbon city development**

- Energy conservation on the demand side can be achieved through a multitude of 3R (reduce, recycle, reuse) measures, through dematerialisation and through capacity building within local governments. For instance, it is important to enhance local capacity in developing countries to innovate, manufacture, install and maintain low carbon technologies. Effective means of introducing low carbon technologies will be a key issue from both cost and benefits perspective.
- There are four means to accomplish the goal of LCS: changing peoples' lifestyles towards sustainable consumption of resources and emission reduction; utilising renewable energy and energy efficient technologies; expanding green areas as carbon sinks; and mainstreaming the notion of LCS in the overall urban developmental policy. Local governments are much better positioned to resolve socio-economic and environmental problems effectively than entities at the national level. Governments also need to accelerate sector-wise actions including conservation actions for natural resources through re-habitation and re-forestation

### **Recommendations for a low carbon urban environment**

- Political correctness must be replaced by a more candid explanation of trade-offs and outcomes to different section of trade-offs and outcomes to different sections of society and how these trade-offs are distributed over time. For instance, decision makers and experts need to clearly explain how climate mitigation and adaptation options with high costs in the short run will reduce costs later. Domestic stakeholders should be made aware that such long-term benefits not only lead to avoided climate impacts but create co-benefits like energy security, sustainable development, local pollution reduction, and employment enhancement.
- On the supply side, innovative financing mechanisms can support accelerated development, commercialisation and diffusion of early-stage low carbon technologies. Similarly, regulatory agencies at the national and local levels need to introduce appropriate support mechanisms. Such support systems can induce private companies to increase investment in low carbon technologies which they may otherwise not do
- On the demand-side, different consumer and citizen groups must be engaged in the process of target setting as well as in designing, approving, implementing and monitoring low carbon projects. New institutional structures should incorporate wide stakeholder participation. This will ensure explicit recognition of cross-sector and cross-community linkages and trade-offs, helping to find climate solutions that simultaneously minimise conflicts

- The development of smart city infrastructure as an integrated package by the private sector has tremendous potential for reducing the environmental burden, increasing the quality of life, enhancing vitalisation of the economy and creating new business opportunities.

## Appendix: References

### LCS-RNet Annual Meetings

#### 2010

##### **Copenhagen climate plan**

Jørgen Lund Madsen, City of Copenhagen, Denmark / ICLEI

##### **Hannover Climate Alliance 2020 – On the way to a low carbon city**

Astrid Hoffmann-Kallen, City of Hannover, Germany

##### **Rethinking cities in a post carbon society**

Jacques Theys, Ministry of Ecology, Energy, Sustainable, Development and Sea (MEEDDM), France and Eric Vidalenc, Environment and Energy Management Agency (ADEME), France

#### 2011

##### **Tokyo’s Cap-and-Trade and Green Building Program – Reducing CO2 from Building Sector**

Kenji SUZUKI(Tokyo Metropolis, Japan)

##### **Transforming Urban Infrastructure for Low-Carbon Cities – Issues, Options and Emerging Lessons in Developing Countries**

Feng LIU (World Bank)

#### 2012

##### **Cities & Green Growth:**

Joaquim Oliveira Martins (OECD)

##### **Urbanization, urban infrastructure and low carbon cities**

Shobhakar Dhakal (AIT)

#### 2013

##### **Transition Management for Sustainability and the role of cities**

Derk Loorbach, Dutch Research Institute for Transitions (Drift), Netherland

##### **Evaluation System of CO2 Reduction Effects in Low Carbon City Policies in Japan**

Tsuyoshi Fujita, National Institute for Environmental Studies (NIES), Japan

##### **Scientific Analysis for Developing an Integrated Low Carbon Strategy in Wuxi, China**

Chun Xia, Wuppertal Institut (WI), Germany

##### **Urban Issues**

Niels Schulz, Environmental Consultant United Nations Industrial Development Organization (UNIDO)

##### **Integrating Approach to Sustainable Cities**

Teruyoshi Omura, Panasonic, Japan

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## LoCARNet Annual Meeting

### 2013

#### [Cities and Local Governments in Low Carbon Development](#)

Hikaru Kobayashi, Keio University, Japan

[PDF](#)

#### [Global Protocol for Community-Scale Greenhouse Gas Emissions \(GPC\)](#)

Fong Wee Kean, World Resources Institute (WRI)

[PDF](#)

#### [Implementation of Low Carbon Society \(LCS\) Blueprints](#)

Ho Chin Siong, Universiti Teknologi Malaysia (UTM), Malaysia

[PDF](#)

#### [Country Report – Indonesia](#)

Bambang Setioko, Diponegoro University, Indonesia

[PDF](#)

#### [City Level Low Carbon Actions: Case Studies from Indian Cities](#)

Manmohan Kapshe, School of Planning and Architecture, Bhopal, India

[PDF](#)

#### [Smart community infrastructures](#)

Yoshiaki Ichikawa, Hitachi Ltd., Japan

[PDF](#)

#### [Cities as Pioneers of Low Carbon Society: Comments on Session Presentations and Suggestions for an integrated Approach](#)

Minal Pathak, Center for Environmental Planning and Technology (CEPT) University, India

[PDF](#)

#### [Understanding and quantifying the water-energy-carbon nexus for low carbon development in Asian cities](#)

Shobhakar Dhakal, Asian Institute of Technology (AIT)

[PDF](#)

### 2012

#### [Local Inventory to support Low Carbon City](#)

Sirintornthep Towprayoon (Joint Graduate School of Energy and Environment / King Mongkut's University of Technology Thonburi), Thailand

[PDF](#)

#### [Introduction: Low carbon city](#)

Ho Chin Siong (University Teknologi Malaysia), Malaysia

[PDF](#)

#### [Drivers and Barriers of Mainstreaming the Low-Carbon City Policy in Urban Local Authorities](#)

L.A.S. Ranjith Perera (Sultan Qaboos University), Oman

[PDF](#)

#### [International Contributions of "Future City" Yokohama](#)

Masanori Shoji (Yokohama City Government), Japan

[PDF](#)

#### [Request from a Policy Maker to Researchers on Low Carbon City](#)

Kotaro Kawamata (Ministry of the Environment Japan), Japan

[PDF](#)

#### [Low Carbon City](#)

Ho Chin Siong (University Teknologi Malaysia), Malaysia/ Junichi Fujino (National Institute for Environmental Studies), Japan

[PDF](#)

#### [Integrated Assessment Model for Low Carbon Growth Policy and the Importance of GHG Emissions Reductions in Cities](#)

Soichiro Seki (Ministry of the Environment Japan), Japan

[PDF](#)

### 2010

**Carbon Reduction as a National Co-benefit, A better life in Low-Carbon City**

Sirithan Pairoj-Boriboon, Thailand Greenhouse Gas Management Organization (TGO), Thailand

[PDF](#)

**Low Carbon Activities in a Small City : Case of Muang Klang Municipality**

Somchai. Chariyacharoen, Muang Klang Municipality, Thailand

[PDF](#)

**Green Design & Planning of Urban Infrastructure in Asian Cities**

Ariya Aruninth, Chulalongkorn University, Thailand

[PDF](#)