

RENEWABLE ENERGY IN APEC LOW-CARBON MODEL TOWN PROJECT

Kazutomo Irie, Asia Pacific Energy Research Centre, Japan, Phone: +81 3 5144 8551, E-mail: kazutomo.irie@aperc.iecej.or.jp

Overview

This paper discusses the status and expectations for renewable energy in APEC's (Asia Pacific Economic Cooperation) Low-Carbon Model Town (LCMT) project. The LCMT project aims to combine various components such as energy-efficient buildings, transport and low-carbon power systems to create communities that affordably reduce energy use and carbon emissions while creating liveable conditions. Renewable energy is an important supply side component of low-carbon town development in the APEC region. Moreover, renewable energy in urban areas can meaningfully contribute to low-carbonisation of the APEC area as a whole.

Methods

Historical analysis of renewable energy in APEC LCMT project, mainly referring to APEC reports.

Results

APEC Energy Ministers launched the APEC LCMT Project in June 2010 at their 9th Meeting in Fukui, Japan. In their Fukui Declaration, the Ministers issued the following statement: "Introduction of low-carbon technologies in city planning to boost energy efficiency and reduce fossil energy use is vital to manage rapidly growing energy consumption in urban areas."

The LCMT Project consists of three activities: Developing and refining the 'Concept of Low-Carbon Town in the APEC region' ('Concept') by APEC experts (Study Group A); A feasibility study of low carbon development for each case study town by consultants; And a policy review of low carbon development policy of each case study town by APEC experts (Study group B). Since 2011, one town/city has been chosen as the case town for each year's phase. The case towns represent various types of town/city in the region.

In October 2011, the First Edition of 'Concept' was published and 'Use of renewable energy' was identified as one of the supply side measures for low carbon town development. The 'Concept' explains the necessary considerations for using renewable energy in towns: "While solar energy and underground heat energy can be utilised regardless of the regional characteristics, there will be a higher potential for utilisation in suburban areas or middle/small-sized local towns rather than in the central areas of large towns."

During subsequent phases, the 'Concept' has been refined to take into account a different type of LCT development in each phase. Several paragraphs were added to elaborate the role of renewable energy in low-carbon town development. The refinement process of the Concept itself has changed considerably since Phase 3 with the inclusion of the APEC Low-Carbon Town Indicator (LCT-I) System in November 2016 as a self-assessment tool, in order to assess and monitor the progress of each low-carbon town development project.

The Yujiapu Financial District (YFD) Development Project in Tianjin, China was the first case study town covered in Phase 1 (2011) of the project. However, renewable energy was not included in low-carbon measures for YFD and the review team did not recommend considering the possibility of introducing renewable energy. The potential to introduce renewable energy in YFD may have been regarded as very low as the development was located in the Central Business District (CBD) of a large city.

However, Samui Island (Koh Samui), Thailand in Phase 2 (2012) is situated in a rural area with considerable renewable energy potential. The review team emphasised that the "Utilisation of renewable energy is instrumental in the development of any low-carbon town, it is important that Koh Samui authorities build on existing research and analysis to clarify potential end uses. At the same time in order to encourage its use it is important that methods of reducing initial high capital costs are considered." The Phase 2 Study Group B produced 82 recommendations, 10 of which are for further improvement of the development and implementation of various kinds of renewable energy.

Da Nang, Viet Nam was chosen as the case town for Phase 3 (2013). The Phase 3 Study Group B produced 75 recommendations for implementation. The recommendations were grouped by high, medium and low order urgency level for the first time. Among 10 recommendations related to renewable energy, 3 are classified at the high urgency level which can be implemented in the short term but at low cost. It is noteworthy that the review team paid attention mainly to solar photovoltaic systems. Among 10 recommendations for renewable energy, seven concern photovoltaic systems, including three urgent recommendations. This is most likely because the Da Nang project is located in a relatively large city with good solar radiation resources where photovoltaic systems represent the most promising renewable energy source. The other three recommendations relate to renewable energy in general, solar hot water systems and wind energy.

For San Borja, Lima, Peru in Phase 4 (2014), the review team made 50 recommendations for implementation, also grouped in order of high, medium and low urgency levels. The team discussed energy efficiency and renewable energy together. Among 12 recommendations related to energy efficiency and renewable energy, 5 recommendations are related to both energy efficiency and renewable energy. Among them, only one specifies solar energy as a promising renewable source in San Borja, but only with low order urgency level.

Bitung, Indonesia was chosen for Phase 5 (2015). The policy review team made 64 recommendations for implementation, grouping of those for immediate action, for action in the next 2-3 years or for action in the longer term. This time the review team discussed renewable energy together with untapped energy. All 4 recommendations related to these topics emphasise renewable energy rather than untapped energy with one identifying biofuel as a promising renewable energy source in Bitung. Additionally, among the recommendations for low-carbon building, three recommendations promote photovoltaic panels in the building sector.

For Mandaue, the Philippines in Phase 6 (2016), the policy review team made 52 recommendations for implementation, grouped by the same priority levels as the previous Phase. The review team again discussed renewable energy together with untapped energy. Among 7 recommendations related to renewable energy and untapped energy, 3 recommendations are on renewable energy, 3 on untapped energy and one on renewable energy and untapped energy in general. Solar photovoltaic is the main renewable energy type discussed, and some attention is also paid to solar water heating.

Krasnoyarsk, Russia was chosen as the last case town in Phase 7 in 2017. The policy review team made 67 recommendations for implementation, grouped by the same priority levels as the previous Phase. However, this time the review team discussed renewable energy separately from untapped energy. Five recommendations related to renewable energy are all general and not specific to any kind of renewable energy. As a basis to make recommendations, the experts pointed out the possibility of biogas and low potential of solar and wind power in their findings. They suggested biomass could be introduced in Combined Heat and Power (CHP) and in waste incineration plants. The APEC LCMT Project has entered a transition period from survey and research stage in Phases 1-7 to its Dissemination Phases in 2017.

Conclusions

APEC LCMT Project is currently in the middle of its Dissemination Phases. From Dissemination Phase 1, the Project has been focusing on disseminating LCT throughout the APEC Region by promoting the application of the LCT-I System to towns/cities which aspire to become less carbon intensive.

As shown in policy recommendations to previous case towns for the project, renewable energy's role in low-carbon town development has been still low-key. Among various sources of renewable energy, solar photovoltaic has been the most commonly recommended in low-carbon town development. Other sources, such as biofuels and biogas, have also been promoted depending on each town or city's location and climate.

In September 2014, APEC Energy Ministers issued a statement to 'reaffirm the UN "Sustainable Energy for All" initiative and instruct the APEC Energy Working Group) to develop the road map for the aspirational goal of doubling the share of renewables in the APEC energy mix, including in power generation by 2030'. In order to attain this goal, APERC's Peer Review on Low Carbon Energy Policy (PRLCE) project is expected to contribute to promoting renewable energy at the economy (national) level. However, the region needs to increase renewable energy supply also at the town/city level in the face of rapid urbanisation. It is hoped that following seven phases the APEC LCMT Project will contribute further promotion of renewable energy at the town/city level. As such, renewable energy in urban area can contribute to low-carbonisation of the APEC area as a whole.