Klang is a small municipality in Thailand’s Rayong Province which spans an area of 14.5 square kilometers and is host to a population of 29,618 people. The ISO 14001 standard has been granted to the Klang municipality for the past 12 years. A recent study (TGO and JGSEE, 2011) indicated that in 2009, the Klang municipality emitted greenhouse gases (GHG) of approximately 38,349 tons of carbon dioxide equivalent (CO2e). However, the Klang municipality has planted many trees to prevent erosion which together absorb about 887 tons of CO2e per year. Therefore, the total net GHG emission of the municipality is about 37,462 tons of CO2e. The emissions stem mainly from buildings and the residential sector (46 per cent), the transportation sector (29 per cent), the industrial sector (17 per cent), the waste sector (6 per cent), and the agricultural sector (2 per cent). As a small-scale city, the Klang municipality emits GHG of 2.22 tons of CO2e per capita per year, compared to the national average annual per capita emission of 4.29 tons of CO2e.

The Klang municipality, with technical assistance from the Thailand Greenhouse Gas Management Organization (TGO) and the Joint Graduate School of Energy and Environment, King Mongkut University of Thonburi (JGSEE), has undertaken studies and organized three public consul-
tions to develop a carbon reduction plan and projects as part of a low-carbon city programme. The proposed GHG mitigation projects and activities focus on energy savings and transportation management. In terms of energy savings, installing energy-efficient light bulbs and other energy-saving electrical appliances did not lead to a significant reduction in CO2 emissions; however, these measures were able to be implemented immediately and with relative ease. On the other hand, in terms of transportation management, the promotion of bicycles as a mode of short-distance transport instead of cars and motorcycles can significantly reduce GHG emissions within the transportation sector. However, it also requires a high investment for building the necessary infrastructure and a change in laws and regulations.

With this carbon reduction plan, the municipality will be able to cut emissions by 6,000 tons of CO2e per year over the next ten years. However, if reforestation becomes a strong policy, carbon sequestration could transform the Klang municipality into a "zero emissions" - or carbon neutral - area. After public consultations, the municipality has agreed to reduce net GHG emissions to zero as its target for the next ten years.

As an immediate action, the municipality has decided to implement its waste management and rice production projects as a priority due to the co-benefits of both projects. For instance, the installation of an additional waste selection conveyor for the city’s recycling programme can help manage organic waste by diverting it to uses such as feeding animals, raising earth worms for soil conditioning, as fertilizer etc. These activities can reduce methane from the landfill by 15.37 tons of CO2e in the first year and up to 448.42 tons of CO2e over ten years. The waste would be digested and release more methane in later years. Activity co-benefits include the income from this recyclable waste selected from the conveyor, reducing the cost of landfill due to the reduced amount of waste left to the landfill (approx. 1,040 US dollars per year), and extending the landfill life.

For the rice production project, the underlying concept involves growing rice and processing it within the Klang area as an alternative to buying rice from other areas. The emissions reduction can be achieved through both reducing the transportation of rice and its by-products to the city and through a reduction in methane when compared to normal rice-growing practices. A small-scale rice mill will be constructed and operated in 2013. The municipality has allocated approximately 8.6 square kilometers for rice cultivation, with an annual rice production capacity estimated to be 3,570 tons. The emission reduction is expected to be approx. 60 tons of CO2e per year, or 600 tCO2e for the ten years of the rice mill’s life time. The co-benefits of this project are a lower price for consumers, new jobs for the agricultural sector, increased control over land use, and a pilot area for testing and improving low-methane rice growing practices. At present, the emission reduction of these two projects is financially supported with 1.5 million Thai baht (46,800 US dollars) through the company’s CSR activities.

The carbon reduction programme and activities of the Klang municipality could serve as a model for the Thailand Voluntary Emission Reduction (TVER), a domestic carbon market based on the co-benefit approach. In addition, the study’s team (TGO & JGSEE) recommends nine steps for low carbon cities:

1) surveying of the main activities of the city;
2) conducting an emission inventory;
3) exploring possible emission reduction measures/technologies/approaches;
4) analyzing and selecting the proposed measures/technologies/approaches;
5) forecasting the emission in the cases of both with and without mitigations;
6) setting up a reduction target;
7) establishing an action plan with stakeholder consultation;
8) implementation and evaluation; and
9) revising the target, guidelines and measures/technologies/approaches.
Finally, it is important that the target must be able to be measured, reported and verified in order to be a Low Carbon City (LCC). The Klang Model indicates that the key to success lies in the leadership of the city as well as broad public support.

References:
3. TGO, Guideline to Develop a Model for National Inventory of Greenhouse Gas, Bangkok, 2010