A STUDY ON QUANTITATIVE DESIGN TOWARDS A LOW CARBON SOCIETY CONSDERING CHARACTERISTICS OF REGIONS

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1. Objective

It has been increasingly important for municipalities to develop scenarios and action plans towards a low carbon society. This study develops a method to design a low carbon society quantitively and consistently. Particularly, this study develops a tool which can estimate regional caracteristics of smaller zones in a municipality like industrial structure, employment situation lifestile and so on. This method can design the low carbon society quantatively and consistently on each smaller zone in a municipality. Moreover, disscusions towords a low carbon society will become more efficient and effective to use the method. The method is applied to eight regional activity zones (RAZs) in the Shiga prefecture, Japan. Targeting the 2030, counter measures to achieve 50% reduction of CO_2 related to 1990 are defined.

2. Developed method

The flow of the method proposed in this study is shown in figure 1. After setting a framework of a scenario including target region and activity, base year and target year and low-carbon target, socio-economic and energy consumption status of the base year are examined. Next, based on socio-economic assumptions in the target year, socio-economic indicators (GDP, population, production of industries, time use, transport demand and building stock and so on) and CO_2 emissions are estimated by RAZs, using quantitative estimation tool which is developed in this study. Finally, low carbon counter measures to achieve the targets are defined by RAZs, through iterative try-and-error process.

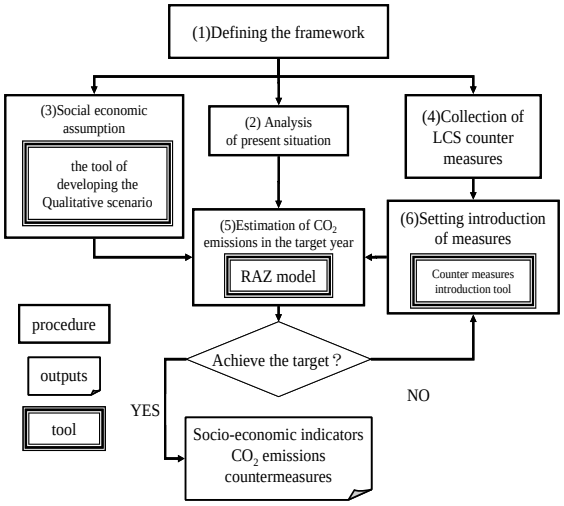

Figure 1. Flow of the method

3. SCENARIOS AND RESULTS

Assumptions on socio-economic indicators in the target year were described for each of RAZs. In addition to industrial structure, three key uncertainties were defined; urban structure, household size and commuting. The characteristic of each RAZ was assumed to be more prominent in the target year. Based on those assumptions, future estimation was conducted and counter measures to achieve the target, 50% reduction, were defined. Figure 2 shows emissions reduction amount by counter measure by RAZ. In this application example, energy efficiency improvement showed large reduction amount in Otsu, Higashi-ohmi and Moriyama RAZ. In Nagahama and Ohmi-hachiman RAZ, diffusion of renewable energies showed larger share compared to other RAZs.

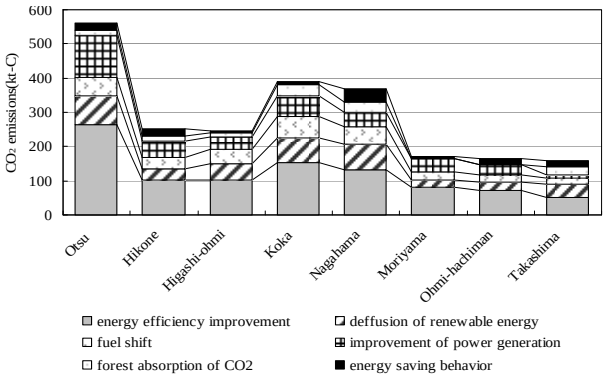

Figure 2. CO_2 reduction by counter meures