

Study on the Strategic Urban Planning and Assessment of Low-Carbon Cities

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[Abstract]

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Our research project is composed of 4 sub-themes (S1-S4). S1 refers to “Roadmap of Factor 5 - Technology Assessment Expert Panel”; S2 refers to “Urban Energy and Material Metabolism – Analysis Framework Tool”; S3 refers to “Urban Design and Urban Energy Assessment – Analysis Data and Knowledge Stocks”; and S4 refers to “Application to Developing Asian Countries – Network Building/Technology Transfer.”

In S1, we produced a roadmap to reduce CO₂ emissions in the Nagoya metropolitan area by 80 percent by 2050 compared to 1990 levels. Discussions were held about its feasibility as well as methods of application of socioeconomic strategies and technologies to achieve this goal. In S2, we developed an analytical model which makes it possible to dynamically simulate CO₂ emissions in the medium and long-term by reconfiguring the urban space in accordance with changes in the structure of industry and society. We also assessed separately various building construction and city-block-level design methodologies to reduce energy consumption. In S4, we investigated application of the policy evaluation tools, which have been developed in S1-3 focusing on Japanese cities, to developing Asian countries. We also contributed to research activities relating to low-carbon cities both in Japan and internationally.

Under this project, we are aiming to integrate theory, proof, and practice in order to create low-carbon cities. Here we describe the achievements of this project. For “theory,” we (1) created a roadmap aiming at an 80 percent reduction in CO₂ emissions in 2050 compared to 1990 levels in the Nagoya metropolitan area, (2) classified cities by local characteristics and summarized low-carbon policies and measures depending on those characteristics, and (3) implemented theoretical assessments for the methodologies to introduce energy efficient technologies at the city-block level in order to raise the effectiveness of CO₂ reduction efforts, and also assessed city-block configuration approaches. For “proof,” we used the city simulator to assess approaches to configure urban space. For “practice,” we bolstered collaboration with Nagoya and neighboring municipalities in Aichi Prefecture and so on. We also made an effort to construct cooperative relationships with research institutions both in Japan and overseas (such as the IPCC), and worked to disseminate our research findings through collaboration with other projects.