

## Comparison of municipal scale energy system analysis

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### Summary:

Low carbon actions in municipal scale are keys to realize low carbon society. However, low carbon society scenario in municipal scale tends to be a reduced scale copy of the national scale scenario. In addition, conventional municipal scale energy system analyses were implemented independently and were not compared with the results of other regions. In this study, we developed a technology selection energy system model (regional AIM/Enduse) which could consider local energy resources, such as solar photovoltaics (PV), combined heat and power (CHP) and wasted heat utilization from power plant. We selected two analytical sites, Shinchi-town and Soma-city in Fukushima prefecture, and compared the estimated mitigation options. We set two CO<sub>2</sub> emission scenarios; the BAU scenario (no target) and the mitigation scenario which set the 80% CO<sub>2</sub> emission reduction target compare to 2005 level in each site.

The results show that 80% emission reduction is available in both sites with large scale penetration of solar PV (28MWp in Shinchi, 158MWp in Soma in 2050), CHP (1.4MW, 13.2MW), and waste heat utilization (0TJ, 450TJ). Key mitigation options would be solar PV in Sinchi-town and CHP and waste heat utilization in Soma-city because major CO<sub>2</sub> emitters in each site are different (building in Shinchi and industry in Soma). In both site, CHP would be introduced from 2020 and solar PV would be gradually developed after 2030. Comparison of municipal scale energy system analysis can identify the unique and common features for local mitigation scenario.

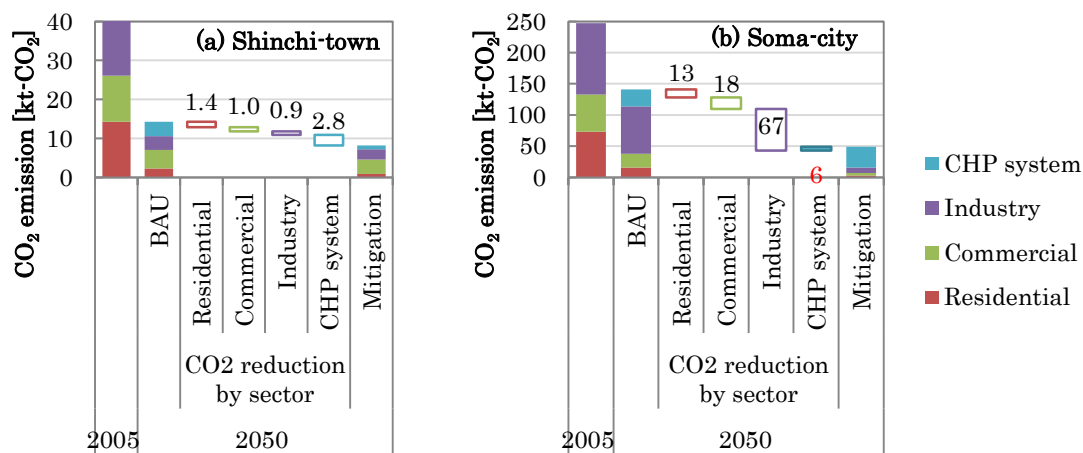


Fig. Estimated CO<sub>2</sub> emission and reduction by sector

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