

Correlation Analysis of Energy Use, Architectural Design and Residential Lifestyle in Japan Smart Community

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Abstract : This paper introduces the characteristics of Japanese residential lifestyle and Japanese Architectural housing design, meanwhile, summarizes the results from an analysis of energy use of 12 households in electric-only multi dwellings in Higashida Smart Community, Kitakyushu, Japan. Using hourly load and daily load data collected from smart meter, we explore correlations of energy use in households according to the incentive of different levels of architectural characteristics and lifestyle, following three factors: Space (Living room, Kitchen, Bedroom, Bathroom), Time (daytime and night time, weekdays and weekend) and User (Elderly, Parents, Kids). The energy consumption reports demonstrated that the essential demand of household's response to variable factors. From that exploratory analysis, we can define the role of housing equipment layout and spatial layout in residential housing design. Likewise, determining preferred spaces and time use can help to optimize energy consumption in households. This paper contributes to the application of Smart Home Energy Management System in Smart Community in Japan and provides a good experience to other countries.

Keywords : smart community, energy efficiency, architectural housing design, residential lifestyle

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