

概要

本報では、生活の質を落とさずに家庭部門の低炭素化を実現するための方策を検討した。

家庭への省エネ情報の提供は、新たに設備機器を導入することなく実施できる低炭素化策として有望である。LCS では社会心理学に基づき、“Nudge”の概念や目標値の設定 (Goal/Target Setting) を取り入れた節電アドバイス機能を開発し、i-cosmos に実装した。さらに、本機能が家庭の行動変容にもたらす効果を検証するための予備的実験を冬期に実施し、本機能により節電が促される傾向を確認した。また、複数の家庭をグループ化して、グループ全体の目標値も表示した方が、より高い節電効果を得られるとの結果を得た。

太陽光発電や燃料電池など新たな設備機器の導入も、生活の質に影響を及ぼさない家庭の低炭素化策として有望である。低炭素化設備 (太陽電池、蓄電池、燃料電池) の導入効果を、実データに基づき検証した結果、一般的な住宅と比べて約 68% の CO₂ 削減効果 (年間約 2.5t-CO₂ 削減相当) があり、光熱費 (水道代を除く) に関しては年間約 11 万円削減される、との推計結果を得た。調査対象住宅における 3 電池の導入費用は、年経費換算で現状の 21 万円前後から、2030 年には 3 万円前後まで低下すると予想されることから、3 電池の導入は CO₂ 削減に貢献するほか、将来的には既存住宅においても、経済的な導入メリットが生じ得ると推測された。

Summary

This paper aims to propose a strategy for realizing a low carbon society by suggesting energy efficiency improvements in the household sector without deterioration of quality of life (QOL).

Providing practical energy-saving information to households can be an effective strategy for promoting a low carbon society without additional investment. Based on social psychology, we have developed an energy saving advisory system incorporating the concepts of “Nudge” and target value setting (Goal/Target Setting) and implemented it on “i-cosmos”. Preliminary experiments were carried out to examine how the advisory system actually changed household behavior. The results showed that households that checked the advisory system every week in winter tended to save energy more compared with households that never checked in the same time duration. The Goal/Target Setting was more effective for group energy saving of more than two families and display of the target value of the whole group also produced a higher power saving effect.

Installing facilities such as photovoltaic power cells and fuel cells can also be effective strategies for CO₂ reduction in the household sector. According to analysis based on actual energy data from households that installed new facilities (solar cells, fuel cells and storage batteries), about 2.5 ton of CO₂ (equaling 68% reduction of CO₂ emission) and 110,000 yen in utility expenses were saved per year. LCS research shows that the installation cost of these facilities is estimated to decrease to around 30,000 yen in 2030 from their 2015 cost of around 210,000 yen. These facilities have been installed mainly in new houses; however, it is speculated that not only because of CO₂ reduction, but also other economic advantages will promote their future installation in existing households too.