

Energy use in sales and distribution via B2C E-commerce and conventional retail: a case study of the Japanese book sector

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Summary

Energy use associated with sales and distribution via business to consumer (B2C) e-commerce versus conventional retail is analyzed for the Japanese book sector. Results indicate that e-commerce uses considerably more energy per book than conventional retail in dense urban areas, due to additional packaging. In suburban and rural areas, energy consumption of the two systems are nearly equal because the relative efficiency of courier services compared to personal automobile transport balances out the additional packaging. The main reason e-commerce does not save energy, even in rural areas, is due to the multi-purpose use of automobiles; e-commerce does consume less energy in the case of single purpose shopping trips by automobile. Overall consumption at the national level is nearly the same: 5.6 MJ per book for e-commerce and 5.2 MJ per book for traditional retail. While this difference is smaller than the uncertainty in the result, the *structure* of energy use for the two systems is quite distinct, which suggests reprioritization of energy-efficiency strategies. Important factors influencing the energy efficiency of B2C e-commerce include packaging, loading factors of courier trucks, number of trips per delivery, and residential energy consumption.