

## Appliances facilitating everyday life – electricity use derived from daily activities

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**Abstract:** The purpose of this paper is to present how, using a visualization method, electricity use can be derived from the everyday activity patterns of household members. Target groups are, on the one hand, professionals in the energy sector and energy advisors who need more knowledge about household energy use, and, on the other hand, household members wanting to reduce the energy use by revealing their own habits and thereby finding out how changed activity performance may influence electricity use. The focus is on the relation between utilizing electric appliances to perform everyday life activities and the use of electricity. The visualization method is based on the time-geographic approach developed by Hägerstrand and includes a model that estimates appliance electricity use from household members' activities. Focus, in this paper, is put on some basic activities performed to satisfy daily life needs: cooking and use of information, communication and entertainment devices. These activities appear frequently in the everyday life of households, even though not all household members perform them all. The method is applied on a data material comprising time-diaries written by 463 individuals (aged 10 to 85+) in 179 households in different parts of Sweden. The visualization method reveals when and for how long activities that claim electric appliances are performed by which individual(s). It also shows electricity load curves generated from the use of appliances at different levels, such as individual, household and group or population levels. At household level the method can reveal which household members are the main users of electricity, i.e. the division of labour between household members. Thereby it also informs about whom could be approached by energy companies and energy advisors in information campaigns. The main result of the study is that systematic differences in activity patterns in subgroups of a population can be identified (e.g. men and women) but that directed information based on these patterns has to be made with care and with the risk of making too broad generalizations.

**Keywords:** *Electricity use, Everyday activity sequence, Visualization, Activity pattern, Load curve.*

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### 1. Introduction

Information is a relatively cheap way to make efforts to influence people to change their everyday life activities in order to better comply with the policies aiming at mitigating climate change from overuse of resources, among them electricity [1,2]. Information as a means to influence people's daily routines is not effective unless the individuals judge the information to be relevant to them. Therefore information must be targeted carefully. Who is to be targeted with information about energy saving and energy efficiency activities? This question has to do with the correspondence between which household members are in the energy company's billing register and which household member(s) utilize the electricity demanding appliances in the home. The aim of this paper is to present how the visualization method *VISUAL-TimePacTS/energy use*<sup>1</sup> can be used to study energy use in households and can facilitate the identification of the actual users of electric appliances within these households. Thereby relevant information for various target groups can be developed. The method has been developed in an interdisciplinary research group in which scientists from social science, visualization science and physics cooperate on a long term basis [3,4,5,6,7]. The method aids

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<sup>1</sup> VISUAL-TimePacTS: VISUAL = visualization, P = place, Ac = activity, T = technology, S = social companionship; time is, of course, time.













