Adoption of electric vehicles in commercial fleets: Why do car pool managers campaign for BEV procurement?

Joachim Globisch\textsuperscript{a,b,*}, Elisabeth Dütschke\textsuperscript{a}, Martin Wietschel\textsuperscript{a,b}

\textsuperscript{a}Fraunhofer Institute for Systems and Innovation Research ISI, Breslauer Str. 48, 76139 Karlsruhe, Germany
\textsuperscript{b}Karlsruhe Institute of Technology, Hertzstr. 16, 76187 Karlsruhe, Germany

\textbf{A R T I C L E I N F O}

Keywords:
Acceptance
Electric vehicles
Commercial fleets
Motivation
Organizational innovation adoption

\textbf{A B S T R A C T}

We use regression analysis to study what motivates car pool managers to campaign for BEV procurement using primary data from 229 car pool managers including adopters and non-adopters of EVs. Key findings are that a personal interest in EVs due to technophilia increases the intention to start procurement initiatives for BEVs. These findings underpin the fact that the attitudes of single individuals can influence internal organizational decision processes and therefore play an important role in explaining BEV adoption in commercial fleets. Other factors that foster initiatives for BEV procurement are organizational innovativeness, and the expectation of environmental benefits and positive effects on employee motivation. The fear of mobility constraints and doubts about the reliability of BEVs counteract the intention to campaign for their procurement.

\section{1. Introduction}

Replacing conventional passenger vehicles by electric vehicles (EVs) is one of the main options to make our cities and transport system more sustainable. Commercial vehicle fleets play a crucial role in achieving a wider diffusion and positive environmental impact of EVs: First, these have a higher annual mileage than privately used vehicles bringing to bear their low running costs and, if charged by electricity from sources with low carbon intensity like renewable energies, environmental benefits (NHTS, 2009; Plötz et al., 2014). Second, at least for countries where respective data is available, they account for a high share of newly registered passenger cars (60% for Germany, KBA, 2014; 54% for the UK, Department for Transport, 2013). Third, they are resold more quickly than privately owned cars and diffuse through the second-hand car market (Plötz et al., 2013; Gnann, 2015), i.e. commercial adoption is also likely to trigger private adoption.

Therefore, the focus of this paper is on the factors that influence the uptake, i.e. the acceptance of EVs in commercial fleets – a topic that has been largely neglected so far (cf. Rezvani et al., 2015). The few papers that have studied the adoption decision of EVs in commercial fleets have mainly identified drivers and barriers. Kaplan et al. (2016) conclude that ease of use of EVs is evaluated more favourably in organizations which already adopted such vehicles. The authors point out that more research is needed to assess the directionality of this relation. Furthermore Kaplan et al. find that managers of larger fleets consider themselves as more familiar with EVs and Sierzchula (2014) states that high costs can deter especially smaller organizations from converting larger numbers of their pool car fleet to EVs. I.e. the size of the car pool or organization might influence EV adoption. Sierzchula (2014) further concludes that improving corporate image and the organizational desire to be in the vanguard are perceived as advantages of EVs, while their comparatively high costs and limited driving range are the main drawbacks (see Sierzchula 2014 for determinants of the
organizations' decision to adopt electrical pool cars and Koetses and Hoen 2014 for determinants of the employees' decision to adopt electrical company cars).

Sierzchula (2014) also mentions the importance of the attitudes and preferences of influential individuals for the organization's stance towards EV adoption. However, neither of these studies explored the internal organizational processes that precede the adoption decision in depth. Instead, the focus on the interests of the organization or its top management implies that organizations are perceived as unitary actors with a homogenous set of preferences. In contrast, Nesbitt and Davies (2013) conclude that preferences and priorities with regard to EV adoption can differ between actors in an organization. E.g., car pool managers focus more on reliability whereas the top management gives more weight to image and environmental officers attach value to the CO₂-emissions. While these differences seem to be tied to the professional roles that these actors play in their organization Kaplan et al. (2016) point out that personal attitudes, familiarity with EVs and subjective norm can be very influential for the decision about EV adoption. In the light of these results it seems promising to dig deeper into the process that precedes the actual adoption decision.

Well-established theories in the field of organizational innovation adoption emphasise the importance of (not necessarily high-level) individuals who act as so-called innovation champions. In this regard Rogers (2003: 414) describes an innovation champion as a “…charismatic individual who throws his or her weight behind an innovation, thus overcoming indifference or resistance that the new idea may provoke in an organization” and refers to Schöns (1963: 84), who states that a “…new idea either finds a champion or dies.” With regard to the phase of agenda-setting (the first step in the process of organizational innovation adoption) Rogers (2003: 422) further quotes March (1981) who concludes: “[Innovation in organizations] often seems to be driven less by problems than by solutions. Answers often precede questions.”. In this regard an innovation champion is someone who has the answer ready and puts it forth when there opens an occasion. So an innovation champion can be especially important to bring an organizational policy forth where no policy has been in existence before. There is evidence that championing the initiation of an EV adoption is a crucial point in the organizational adoption process as there is usually no urgent need for adopting EVs (Nesbitt, 1996). I.e., the initiation of an EV adoption will not take care of itself and its success therefore depends on patronization. Therefore, the focus of this paper is on innovation champions for EVs. More specifically, this paper empirically analyses to what extent car pool managers' campaigning for EV adoption is shaped by their own individual and/or organizational values and interests. The study is based on primary data from a survey of car pool managers (N = 229).

The remainder of this paper is organized as follows. In Section 2 we explain why the Organismic Integration Theory (OIT), a motivational theory approach, is especially suited to forming the theoretical foundation of our analysis and outline the derived theoretical model. Section 3 describes how the theoretical model guides the empirical analysis and presents the data and methodology. We report the results of the analysis in Section 4 and discuss them in Section 5.

2. Theoretical framework

Organizational innovation adoption is usually considered as a process with three phases: initiation, (organizational) adoption decision, and implementation (Hameed et al., 2012). The review of organizational innovation adoption research by Hameed et al. (2012) shows, that analyses of the initiation of innovation adoption in organizations are scarce. Thus, there is no legacy of theoretical models potentially suited for analysing the factors that drive the initiation of innovation adoption in organizations. We base our analysis on the OIT, a motivational approach developed by Deci and Ryan (1985) as part of self-determination theory (SDT). SDT is a well-established psychological theory and has been used in a wide range of studies and fields of application (Vallerand et al., 2008).

OITs suitability for our analysis arises from its ability to depict different forms of motivation: on the one hand, OIT describes intrinsic motivation (e.g. doing something because it is fun or interesting) or autonomous forms of extrinsic motivation (e.g. doing something because it is a good cause; cf. Gagné and Deci, 2005). These forms of motivation can facilitate proactive behaviour, which comprises actions like promoting a particular issue in order to influence an organization's course of action (Parker et al., 2010). Thus, it closely matches Rogers's (2003) definition of innovation champions.

On the other hand, OIT comprises controlled forms of extrinsic motivation. Therefore, it is able to embrace the motivation of car pool managers who act (exclusively) as an agent on behalf of the organization (i.e., the individual's behaviour aims to achieve externally imposed goals; cf. Gagné and Deci, 2005). Thus, OIT is able to reflect adoption processes like those described by Sierzchula (2014) where the car pool manager is driven either by cost-benefit-considerations or the personal preferences of the top management.

In other words, one and the same action (e.g. campaigning for EV procurement) can be driven by different forms of motivation. Our analysis aims to identify to what extent the intention to campaign for EV procurement is driven by controlled extrinsic motivation, autonomous extrinsic motivation, and/or intrinsic motivation.

To do so we develop a theoretical model based on OIT (see Fig. 1). The construct that the model aims to explain is the intention to campaign for EV procurement (hereafter the names of theoretical constructs are printed in italics for better readability). The formation of an intention to act is the precursor of an action (Venkatesh et al., 2003). The decision to focus on the intention to act instead of the specific action is based on methodological and conceptual considerations. Vehicle procurement (especially in smaller car pools) does not occur every day, so that the lack of actual campaigning for EV procurement can either be due to a lack of intention or to a lack of opportunity (e.g. because there currently is no need to purchase a vehicle, as other tasks are of higher priority in the next weeks). Nonetheless, intention is a necessary precondition in this case to act. We therefore expect more valuable and concise results from surveying the intention to campaign for EV procurement.

Nevertheless, as acknowledged before, intentions do not necessarily translate into actions, the so called ‘intention-behaviour gap’ or as a related challenge ‘attitude-action gap’ – an issue that has been repeatedly subject to research especially in the field of car acquisition (cf. Lane and Potter, 2007; Mairesse et al., 2012). In the literature (cf. deHaan and Kuckartz, 1996; Homburg and
دریافت فوری
متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات