

Chapter 10

Electric Car-Sharing as a Solution Supporting the Development of Electromobility and an Element of the Travel Chain

Grzegorz Sierpiński

Silesian University of Technology, Poland

Katarzyna Turoń

Silesian University of Technology, Poland

ABSTRACT

The recently observed increase in the number of car-sharing operators using a fleet of electric vehicles created an opportunity to expand existing ecological travel chains. Electromobility is one of travelling options that reduces the transport carbon footprint. The goal of the chapter is to draw attention to the need of using car-sharing to promote environmentally friendly behavior and overcome concerns related to using an electric vehicle. The work presents the development of electric car-sharing in Europe and indicates challenges for further expansion of electromobility. By adding electric-car-sharing to the travel chain, the perception of ecological travelling significantly changes, since it combines various advantages for the user (e.g., comfort of travelling and individual trip) and a positive effect of such a choice on the environment and the city.

INTRODUCTION

Sustainable transport development is a challenge for today's cities. It is often difficult to convince people who travel using environmentally friendly modes, such as public transport, cycling or walking (among others Banister (2008), Gärling and Fujii (2009), Ruiz et al. (2018), Sierpiński et al. (2016). Although, in recent

DOI: 10.4018/978-1-5225-9570-0.ch010

years, electromobility has been added to the group of pro-ecological solutions (Federal Ministry for Economic Cooperation and Development (2016), Cansino et al. (2018), the increase in the share of electric cars in relation to conventional vehicles is still too slow. It results from the lack of sufficient trust in new solutions (Czech et al., 2018). Other reasons include major barriers in selected countries, such as a high price of an electric car or poorly developed infrastructure (low number of charging stations) (Kubik, 2018; Turoń et al., 2018).

It should be noted that considering organizational solutions there is a chance to change the situation. Car-sharing enables to rent a vehicle temporarily (Turoń & Czech, 2019). The solution itself some features that can be appreciated by the city (Awasthi et al., 2009). It limits the number of cars in the road network in a given area during the day and reduces space occupied by vehicles (Luan, 2018). At the same time, car-sharing can be an element of the travel chain. A traveling person, knowing that she/he can use the car-sharing service in the destination city, will more likely choose public transport (e.g. railway or coach connections) to travel to the city.

Bearing in mind the above, the use of the fleet of electric vehicles in the car-sharing service allows, on the one hand, to maintain the positive features of the service itself, and on the other hand, it is an important way of promoting electromobility in the city (among others Dijk et al., 2013), Mounce et al. (2019). Thus, we can much faster overcome barriers resulting from the lack of knowledge among people traveling as regards the use of electric cars. Moreover, the implementation of electric car-sharing also forces faster development of infrastructure and building a larger number of charging stations.

Decision making regarding the sustainable travel chain can be supported by modern technologies. The purpose of the chapter is to present challenges faced by modern cities, which are related to the development of electromobility. As the first step, electric car-sharing may be implement and develop. Selected research in the area have been funded by the National Centre for Research and Development as a part of the international project under the ERA-NET CoFund Electric Mobility Europe Programme “Electric travelling - platform to support the implementation of electromobility in Smart Cities based on ICT applications” (Project Proposal, 2016).

E-CAR-SHARING, OR CLASSIC CAR-SHARING WITH A FLEET OF ELECTRIC VEHICLES: CHARACTERISTICS, CLASSIFICATION, AND MARKET’S PRACTICES

The development of various forms of urban mobility designed to reduce negative impact of traffic on the natural environment has become a major focus of the European Union in the context of “green transport” and “clean energy” (“Clean Power for Transport: A European alternative fuels strategy”, COM (2013). The promotion of transport using alternative energy sources fits very well into this trend. Currently, a particularly strong emphasis is put on mobility services based on the use of electric vehicles (“Online Platforms and the Digital Single Market, Opportunities and Challenges for Europe”, COM 208 (2016). From the point of view of an individual user, electromobility is costly. Apart from a significant cost, it still struggles against limited availability to infrastructure dedicated to electric vehicles (Sierpiński, 2018; Turoń, 2018; Turoń & Sierpiński, 2018; Turoń et al., 2018) and reluctance of users to a new technology (Carleton (2016). A solution to the above is to offer such transport services to the public. It includes, for example, ride-sourcing based on the use of electric vehicles (e.g. Uber), e-hailing (e.g. Taxify) or electric car-sharing. From the point of view of the user and her/his experience with electromobility, car-sharing provides the largest possibilities to drive and short-term use of electric vehicles.

17 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/electric-car-sharing-as-a-solution-supporting-the-development-of-electromobility-and-an-element-of-the-travel-chain/241334

Related Content

An Empirical Investigation on the Use of Buffers and Incentives in Non-Hierarchical Networks

Roberto Pinto, Fabiana Pirola and Tobias Mettler (2011). *International Journal of Applied Logistics* (pp. 29-43).

www.irma-international.org/article/empirical-investigation-use-buffers-incentives/60544

Information and Communication Technologies to Achieve an Optimal Relationship Between Supply Chain Management, Innovation, and Performance

Héctor Cuevas-Vargas, Neftalí Parga-Montoya and Octavio Hernández-Castorena (2020). *Handbook of Research on Industrial Applications for Improved Supply Chain Performance* (pp. 262-284).

www.irma-international.org/chapter/information-and-communication-technologies-to-achieve-an-optimal-relationship-between-supply-chain-management-innovation-and-performance/239055

Selection of Transportation Channels in Closed-Loop Supply Chain Using Meta-Heuristic Algorithm

Sonu Rajak, P. Parthiban and R. Dhanalakshmi (2018). *International Journal of Information Systems and Supply Chain Management* (pp. 64-86).

www.irma-international.org/article/selection-of-transportation-channels-in-closed-loop-supply-chain-using-meta-heuristic-algorithm/206163

A Digital Transformation in International Transport and Logistics: Blockchain

Birsen Koldemir (2020). *Handbook of Research on the Applications of International Transportation and Logistics for World Trade* (pp. 425-453).

www.irma-international.org/chapter/a-digital-transformation-in-international-transport-and-logistics/245402

The Role of Electronic Supply Chains and ERP Systems in the Realm of E-Commerce

Jean C. Essila (2019). *Managing Operations Throughout Global Supply Chains* (pp. 1-19).

www.irma-international.org/chapter/the-role-of-electronic-supply-chains-and-erp-systems-in-the-realm-of-e-commerce/231694