



Why Did Better Place Fail?: Range anxiety, interpretive flexibility, and electric vehicle promotion in Denmark and Israel



Lance Noel^{a,*}, Benjamin K. Sovacool^{a,b}

^a Center for Energy Technologies, Department of Business Development and Technology, Aarhus University, Birk Centerpark 15, DK-7400 Herning, Denmark

^b Professor of Energy Policy, Science Policy Research Unit (SPRU), School of Business, Management, and Economics, University of Sussex, United Kingdom

HIGHLIGHTS

- Better Place was a well-conceived business model to encourage electric vehicles.
- Despite substantial funds, Better Place declared bankruptcy, selling 1300 cars.
- We identify several reasons Better Place failed in Denmark, Israel, and in general.
- We postulate that range anxiety is not a functional barrier to electric vehicles.
- Electric vehicles will require consumers changing and sustained government support.

ARTICLE INFO

Article history:

Received 11 February 2016

Received in revised form

12 April 2016

Accepted 17 April 2016

Keywords:

Electric mobility
Battery swapping
Electric vehicles
Business models

ABSTRACT

With almost \$1 billion in funding, Better Place was poised to become one of the most innovative companies in the electric mobility market. The system Better Place proposed had two novel prongs; first, to reduce the cost of batteries, and second, to reduce range anxiety, public infrastructure concerns, and long charging times. Yet, despite this seemingly strong combination, Better Place failed to make any progress in Denmark and Israel, the first two markets it operated in, and subsequently declared bankruptcy, selling off its collective assets for less than \$500,000. Drawing from science and technology studies and the notion of “interpretive flexibility,” this paper posits several reasons to explain the failure of Better Place, including that Denmark is not as “green” as it seems nor is the Israeli market as attractive as believed, and that Better Place’s solution to charging time and range anxiety resolved a psychological, not a functional, barrier of the general public to adopt electric vehicles. Before investigating these two reasons, the paper presents a short history of Better Place and explores the contours of its operations in Denmark and Israel. It then discusses why Better Place “failed” across both countries before concluding with implications for energy planning, policy, and analysis.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Electric vehicles have the potential to provide society with many substantial benefits, including reduction of carbon emissions, improvement of public health, increasing national security, and savings on fuel and maintenance cost (Neubauer et al., 2012; Tran et al., 2012). Despite these benefits, electric vehicles have yet to be adopted on a large scale (IEA, 2013a, 2015). Specifically in Denmark and Israel, electric vehicle adoption did not historically move beyond a very niche level. While Denmark has had a recent increase in EV sales, total alternative fueled vehicle registration in 2014 was stagnant at about only 3000, only representing 0.1% of all

vehicles in use in Denmark (ANFAC, 2015). Likewise, Israel currently has 1088 electric vehicles, comprising 0.04% of total private registered vehicles (Central Bureau of Statistics, 2016). Several extant barriers to electric vehicles in the late 2000s encountered include higher capital cost, range anxiety, lack of public infrastructure, and long charging time (Lieven et al., 2011; Parsons et al., 2014; van Bree et al., 2010).

Seeking to erode these barriers, with almost \$1 billion in funding, Better Place proposed a novel system to differentiate the purchase of an electric vehicle with recharging the battery (Chafkin, 2014). The system Better Place proposed, launched in 2007, had two novel prongs; first, to reduce the cost of the battery, Better Place would own the battery in the electric vehicle, and consumers would instead pay for an annual “mileage plan” (much like a cell phone data plan), and second, to reduce range anxiety, public infrastructure concerns, and long charging time, Better

* Corresponding author.

E-mail address: lnoel@btech.au.dk (L. Noel).

Place constructed a network of chargers and battery swapping terminals for their consumers to recharge or switch their batteries. These two prongs would reduce initial capital costs, create a network of public chargers, and with battery-swapping, reduce charging time to as little as 2 min (Naor et al., 2015). As one magazine article put it, “Better Place was born to be revolutionary, the epitome of the kind of world-changing ambition that routinely gets celebrated” (Chafkin, 2014).

Thus, in principal, it would appear that Better Place was a well-conceived idea well-poised for success that entirely removed one of the barriers to electric vehicles, long recharging time, and reduce many of the other barriers. Moreover, Better Place, at least as they perceived it, was in one of the world’s “greenest” markets in Denmark, and piloted in another country, Israel, desperately seeking energy security. While neither the “greenness” of Denmark nor Israel’s prioritization of energy security would make or break the Better Place business model, Better Place viewed each of these countries as optimal environments that would help encourage electric vehicle adoption. Finally, Better Place had substantial amounts of funding and important partnerships with major automobile manufacturers, electric utilities and government departments. Nonetheless, despite this seemingly strong combination, Better Place failed to make any progress in Denmark and Israel, and subsequently declared bankruptcy, eventually selling their \$850 million-in assets for only \$450,000 in 2013 (Kloosterman, 2013).

This paper posits several reasons to explain the failure of Better Place, drawing from insights in science and technology studies that hold that new niche technologies possess “interpretive flexibility” and can be constrained by heterogeneous technical and social factors. These include that Denmark is not as “green” as it seems, Israel’s concern of energy security did not prioritize decreasing oil consumption, and, more generally, that Better Place’s solution to charging time and range anxiety resolved a psychological, not a functional, barrier of the general public to adopt electric vehicles. Before investigating these two reasons, the paper presents a short history of Better Place and explores the contours of its operations in Denmark and Israel. It then discusses why Better Place “failed” across both countries before concluding with implications for energy planning, policy, and analysis.

In embarking on this path, the contribution of the article is manifold. First, no studies have yet looked comparatively at Better Place performance across Denmark and Israel, the two markets where it was most embedded. The energy studies literature on the topic so far is out of date. Published studies only focus on its likely trajectory as a success (Andersen et al., 2009; Budde Christensen et al., 2012; Kley et al., 2011), something invalidated by history. We explore why.

Second, examining the trials and tribulations of Better Place brings to the forefront discussions about the profitability and business models surrounding EVs, a topic of high relevance for those looking at secondary markets for batteries or attempting to eliminate key barriers such as range anxiety (Tyfield et al., 2015). A similar model to Better Place is being considered in France with the national electricity supplier EDF and the automobile manufacturer Toyota, whom are focusing on piloting the expansion of recharging networks in France and the United Kingdom (Enbysk, 2014). In these types of models, Better Place acts as something unique: an aggregator or integrator as well as the provider of infrastructure. To use an analogy from telephony, they are the AT&T rather than the Apple. Some have even framed Better Place’s business model as a new archetype known as “Electric Recharge Grid Operators” or ERGOs which can become a transformative agent for merging electric mobility with renewable electricity infrastructure (Andersen et al., 2009). We test the efficacy of such claims.

Lastly, our comparative case study approach in this instance investigates not a project success, but a failure—something understudied in the literature due to both the difficulty in collecting data and the pejorative nature of dealing with unsuccessful projects that often result in bitterness and anger (Brix, 2015). Failure is also more common than success, with many possible permutations leading to failed innovation or adopt but only a contingent synergy of complex factors leading to success. Braun even suggests that “in analyzing technological development, failed innovations are just as important as, and possibly even more so than, successful ones” (Braun, 1992).

2. Research methods and concepts

Our primary method of data collection for this study was a review of the peer-reviewed literature on both electric mobility generally and more specifically the contours and operations of Better Place. We searched key academic databases such as Scopus, ScienceDirect, and EBSCO-Host for articles published in the last ten years (2006–2015). During these searches, we looked for articles relating to (a) the social acceptance of electric vehicles, (b) business models for electric mobility, and (c) case studies of Better Place, of which there were only a handful. We compiled a few dozen studies though we reference only the most relevant ones here.

To help filter this voluminous amount of data, we relied on the concept of “interpretive flexibility” from science and technology studies. This literature argues the evolutionary pathway of a novel technology, such as an electric vehicle or a more refined business approach such as better Place, is not only a function of its technical qualities and characteristics, but equally so of its perception within society. In this context, interpretative flexibility is of great importance as it holds that technology emerges in society as a “seamless web” (Hughes, 1986) or a “sociotechnical imbroglia” (Latour, 1999). This concept of interpretive flexibility emphasizes the mutually constitutive nature of technology, which suggests that differing interpretations of the same technological device are possible. That is, different social groups see particular technologies in different ways. These technologies, then, become “heterogeneous” because their meaning, rather than being fixed, is interpreted and negotiated by those social groups connected to it (Sovacool, 2011). Pinch and Bijker distinguish that technological artifacts possess interpretive flexibility at two levels: first, in how different social groups conceive of technology; second, that there is no one possible way that technologies are designed (Pinch and Bijker, 1984). Artifacts are always the product of inter-group negotiation, and as we will see throughout the article, such negotiation does not always bode well for the future market acceptance of a technology.

3. History of Better Place

Better Place was founded by entrepreneur Shai Agassi in 2007 with the aim to imagine a society that was no longer reliant on fossil fuels. Better Place imagined that the two barriers to the adoption of electric vehicles, and thus the barriers to removing oil from society, were the higher prices of electric vehicles and the problems associated with recharging the battery. While electric vehicles had higher capital costs, lower fuel and maintenance cost made them cost competitive with gasoline vehicles over time. Looking to capitalize on longer term economic benefits, Better Place formulated a way to reduce initial capital costs by monetizing the battery, and recharging thereof, as a service to which customers would subscribe. While Better Place would retain the

Download English Version:

<https://daneshyari.com/en/article/7399392>

Download Persian Version:

<https://daneshyari.com/article/7399392>

[Daneshyari.com](https://daneshyari.com)