Chapter 3

Fuel Efficient Vehicles:
The Role of Social Marketing

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ABSTRACT
Consumers have been slow to switch to more fuel efficient vehicles, in spite of the threat of a future global shortage of fossil fuels. To understand consumer reluctance to adopt hybrid automotive technology, this chapter begins by reviewing consumer decision-making with regard to consumer automotive purchases. We examine the market for fuel efficient vehicles (FEVs) and alternate fuel vehicles (AFVs), including a discussion of consumer willingness to trade personal comfort in order to buy more fuel efficient vehicles, and consumer price sensitivity with regard to purchasing higher-priced alternative fuel vehicles including hybrid-electric vehicles. We discuss the tenuous link between environmental attitudes and behavior, and outline the role of social marketing in creating behavior change relating to automotive purchase decisions.

INTRODUCTION
The number of automobiles in the world has increased from approximately 127 million in 1960 to over 1.1 billion in 2013 (Davis, Diegel, & Boundy, 2015). Around the globe, the growing reliance on the automobile as a mode of personal transportation has led to enormous consumption of gasoline, a non-renewable resource. Gasoline consumption could be substantially reduced if more drivers would switch to fuel efficient vehicles (FEVs) or alternate fuel vehicles (AFVs). However, drivers in most countries have been very slow to adopt these technologies. A pattern of worldwide declining gasoline prices in 2015 (Economist, 2016) has only exacerbated the situation, leaving most drivers with less financial incentive to switch to fuel efficient vehicles.

DOI: 10.4018/978-1-5225-2139-6.ch003
Fuel Efficient Vehicles

In spite of declining gasoline prices in 2015, global sales of hybrid and electric cars rose by 15% in 2015, with the Asia-Pacific region accounting for over 60% of sales (MarketLine, 2015). The number of alternative fuel vehicles in the United States has risen from under 250,000 in 1995 to almost 1.2 million in 2011, an increase of approximately 10% per annum (Davis et al., 2015). While these figures look promising, they equate to less than 1% of all vehicles in the United States, so there is substantial room for growth in the AFV sector. This leads to a key question: How can we encourage consumers to switch from conventional automobiles and instead purchase FEVs and AFVs?

Through a review of the recent literature on how consumers make vehicle purchasing decisions, this chapter will illustrate consumer attitudes and choices related to fuel efficiency. Consumer attitudes and behaviors toward the environment will also be reviewed. Gaining insight into consumer decision processes with regard to selecting their motor vehicles will provide the necessary background for developing effective social marketing campaigns, which can convince consumers to purchase fuel efficient vehicles in the future.

The chapter begins by reviewing consumer decision-making with regard to consumer automotive purchases. We examine the market for FEVs and AFVs. We discuss the tenuous link between environmental attitudes and behavior, and outline the role of social marketing in creating behavior change relating to automotive purchase decisions. The chapter concludes by making recommendations for developing future social marketing campaigns.

AUTOMOTIVE PURCHASE DECISION-MAKING

The research literature indicates that, to date, there has been only a moderate willingness on the part of consumers to purchase vehicles that are more fuel efficient (DEFRA, 2008). In general, consumers do not give a great deal of thought to the issue of fuel efficiency when making a vehicle purchase, or it is not their primary issue of concern. There are several possible reasons for this relative lack of concern about fuel efficiency, including issues relating to convenience, self-identity, and unwillingness to pay higher initial costs for AFVs.

Consumers also seem to have relatively low levels of awareness with regard to the amount of fuel they consume, and what their fuel costs are over time (Turrentine, Kurani, & Heffner, 2007). This suggests that consumers may have little understanding of the potential long-range impact that a more fuel efficient vehicle would have on their fuel costs and energy consumption. As well, consumers seem to consistently underestimate their annual driving mileage by approximately 2,000 miles per year, on average, which would also contribute to an underestimation of the amount of fuel consumed annually (Kavalec, 1999).

There are two basic categories of vehicle that consumers could consider if they were interested in reducing fuel consumption. The first category consists of conventional fuel efficient vehicles (FEVs), which are fuel efficient by virtue of being smaller and lighter, and which use conventional gasoline or diesel fuel. The second category, alternate fuel vehicles (AFVs), is largely comprised of Hybrid Electric Vehicles (HEVs), which do not need to be plugged in, and Electric Vehicles (EVs) and Plug-in Hybrid Electric Vehicles (PHEVs), which do need to be plugged in (Ahmadi et al., 2015). While AFVs could also be thought of as including fuel options such as liquid petroleum gas, propane, and compressed natural gas (CNG), or bio-fuel options such as methanol and ethanol, these types of alternative fuel options in North America are most commonly used for commercial vehicles or fleet vehicles. Therefore our

37
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