Chapter 10

An Integrative Approach to Study on Consumer Behavior towards Plug–In Hybrid Electric Vehicles Revolution:
Consumer Behavior towards Plug–In Hybrid Electric Vehicles

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ABSTRACT

Transport electrification has experienced major deviations for the last few decades. Current investigation towards the implication of green technologies to decrease pollution and increase diffusion of renewable energy in the transportation sector are achieving more attention. The significance of plug-in hybrid electric vehicles (PHEVs) play a key role towards the policy option to reduce the environmental concern. There are major uncertainties in the diffusion of PHEVs timing of market distribution among consumers. However, there has been a considerable effort made towards the benefit of PHEVs demand. Yet, the debates on consumer behavioral economics towards the adoption of electric vehicles are less recognized. Researchers highlight the significance of PHEVs from a combined perspective considering PHEVs which allows bi-directional flow of electricity. However, it mainly focuses on interface among technology adoption and consumer behavior includes many other aspects such as individual adoption behavior, vehicles performance, environmental concern and power system demand.

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INTRODUCTION

Modern studies on green technologies for transportation sector are attaining attraction among the research communities from diverse parts. In this wake, Plug-in hybrid electric vehicles (PHEVs) have a bright future because of their battery system and charging facilities from the traditional power system. Numerous investigators have demonstrated that a great amount of decreases in greenhouse gas emissions and the growing reliance on oil could be accomplished by the transport electrification (Caramanis & Foster, 2009). Although road transportation is not considered as the leading source of greenhouse-gas emissions, but it contributes the major part of the emission. Transportation in recent days are the major unsustainable source of energies, depend on the liquid fossil fuels. Research suggest that the transportation sector at present consume over 55% of oil and emit around 25% of CO2 in total (Howey, 2012). With the introduction of Electric vehicles technology marked a considerable amount of carbon-free transportation in current market trend. By keeping a close consideration of the research on electric vehicle technology, where the main idea was to in cooperated electrically charged battery supported vehicles i.e. PHEVs came into the current market trend. We scale out our domain to study their potential introduction from an integrated perspective. Furthermore, we extend our domain to observe its interactions between technology and economic behavior and its market diffusion influence. Several studies and analysis are extended by taking major confirmations and verifications from Western Europe and North America and Asia in general. On the contrary, the analysis of energy implications is also being kept in close consideration throughout the world. However, Figure 1 displays the energy implication around the world.

The current marketing trend suggests that the transport sector is accountable for over 27% of total energy utilization. In the wake of future growth, it is expected to increase by 50% possibly by 2035 (Tran, Banister, Bishop, & McCulloch, 2012). Keeping in mind overall 94% dependency on oil fuel, passenger vehicle considered to be another source of CO2 emissions weigh up to 6.3 Gt or over 24% in general of Figure 1. Energy implication around the world