



## Potential demand and cost-benefit analysis of electric cars

Pietro Zito<sup>1\*</sup>, Silvia Salerno<sup>1</sup>

<sup>1</sup> *University of Palermo,  
Department of Aeronautical and Transportation Engineering*

---

### Abstract

In this study an analysis of electric family car performances is carried out. In particular, the aim of this research is to appraise the possibility of introducing electric cars in urban mobility and the evaluation of its economic feasibility. First of all, we determined the potential electric car demand, which was forecasted using a stated preference (SP) analysis. The survey was carried out at the University of Palermo considering a particular target of consumer: “the hybrid household”. A logit demand model was calibrated using the SP technique to model the choice between the electric car and the conventional one.

In the second part of the work, the economic feasibility of the electric car is analysed by comparing the operating cost per kilometre of the internal combustion car with that of the electric one. Two options were analysed for electric cars: car purchase and car sharing.

*Keywords:* Cost/benefit analysis; Logit model; Electric cars.

---

### Introduction

The diffusion of electric cars for urban mobility is one of the possible strategies to reduce air pollution caused by road traffic in urban areas, thus realising more sustainable mobility. Road transport is one of the main factors responsible for pollutant emissions. In 1997, it was estimated that road traffic was responsible for about 72% of carbon monoxide, 46% of particulate matter, 53% of nitrogen oxide, and 24% of carbon dioxide emitted during that year. In all European urban areas the emission levels are increasing. Urban paths are often short so that the thermal engine does not have enough time to warm up and along with the repeated stop and go of the vehicle cause a major increase in consumption and pollutant emissions. It has been estimated that the cost for the Community due to diseases caused by pollutant emissions (like respiratory or cardiovascular disease) is about 1.7% of the GDP (Gross Domestic Product).

---

\* Corresponding author: P. Zito (zito@diat.unipa.it)