

Mobility in Engineering and Logistics – Technology and Market Research

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The central challenges of our times include limiting greenhouse CO₂ emissions, reducing our dependence on fossil energy sources, banning toxic air pollutants (especially from urban agglomerations) all while ensuring ongoing individual mobility. Electric mobility has significant potential in enabling us to live up to these challenges. There is a wide choice of electric drives – electric only, electric range extender, plug-in hybrid or fuel cell – which will replace internal combustion engines for certain uses. Especially in urban agglomerations, where distances are short and the environmental restrictions strict, these concepts present compelling advantages. In order to conquer a significant share of the market, electric vehicles must become much more affordable to greater numbers of consumers than they are today – primarily because batteries are so expensive. The prerequisite for realising the potential environmental advantages of electric vehicles is the availability on a large scale of electric power from regenerative sources. In view of their great potential and as a consumer protection organisation, ADAC performs thorough vehicle tests to determine their everyday utility, safety, eco-friendliness and cost-effectiveness, to make the market for new vehicle concepts more transparent and to create a basis of comparison between the new and conventional drives. The first paper about "*Electric Vehicles and Customer Requirements*" by Reinhardt Kolke and Andrea Gärtner focuses on consumer expectations in terms of e-mobility based on the returns of a survey. Additional insights in terms of sustainability, safety and utility on the basis of the range of vehicles available on the market today will be given.

The analysis of comprehensive market survey activities is the focal point also of the second paper, *Consumer Testing for Customer Satisfaction – an Empirical Study Based on Passenger Cars in Germany*. This publication by Jan Hendrik Schreier and Niels Biethahn presents the results of an empirical study of the predictability of customer satisfaction on the basis of ratings from consumer tests for passenger cars. The study was based on the ADAC Customer Barometer market survey aimed at annually determining the motorists' satisfaction with their cars. This survey evaluates over

20,000 interviews and determines the leading car brand and car model in each vehicle class. The project correlates the overall rating and category ratings of the professional ADAC Autotest car reviews with the motorists' overall satisfaction and satisfaction with relevant aspects. Autotest car reviews are a consumer test published by in Germany and by other national consumer protection organisations across Europe. This makes Autotest one of the most powerful consumer tests in terms of coverage in Europe. The paper proceeds from presenting comparable studies to deriving a procedure for correlating consumer tests and customer satisfaction surveys and applying it towards making recommendations for consumer protection testing.

The third contribution, by Christian Rühl and Niels Biethahn, entitled "*Quantitativer Einfluss gesellschaftlicher Trends auf den Fahrzeugabsatz in Deutschland*" identifies which quantitative impact a large number of qualitative factors have on vehicle sales per vehicle class in Germany. Starting from a previous work of the authors, the specific vehicle sales are forecasted on the basis of an extensive data set with the use of an Artificial Neural Network (ANN). The study confirms that Artificial Neural Networks can be used for the prediction of vehicle sales if the specific data records for a long-term period are available. In addition, the investigation shows that complex problems with many indicators can be analyzed by using a large number of input variables which – in some cases – need to be transferred into latent variables.