

Perancangan Produk Electric Vehicle di Indonesia dengan Conjoint Analysis (CA) dan Environmental Conscious Quality Function Deployment (ECQFD): Studi Kasus pada Perusahaan Otomotif XYZ = Product Design of Electric Vehicle in Indonesia with Conjoint Analysis (CA) and Environmental Conscious Quality Function Deployment (ECQFD): Case Study on Automotive Company XYZ

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Abstrak

Peningkatan emisi karbon oleh sektor transportasi berkorelasi dengan peningkatan jumlah kendaraan di Indonesia khususnya kendaraan dengan mesin pembakaran dalam yang mencapai minimal 30% dari total emisi karbon nasional. Emisi karbon menyebabkan kerusakan lingkungan, mendorong pemerintah Indonesia untuk menerapkan kebijakan emisi karbon pada kendaraan ICE, dan adopsi kendaraan berbasis listrik. Namun, tingkat adopsi pelanggan masih terbatas, antara lain karena terbatasnya pilihan produk kendaraan listrik di Indonesia dan harga satuan yang masih relatif mahal. Tulisan ini bermaksud mengeksplorasi desain kendaraan listrik dengan memperhatikan kebutuhan pelanggan untuk mendapatkan desain produk yang paling diminati dan paling mungkin untuk direalisasikan oleh industri terkait. Untuk tujuan ini, integrasi metode conjoint analysis (berdasarkan model kombinasi penuh) dan penerapan fungsi kualitas sadar lingkungan (QFD) dilakukan, membantu dalam menghubungkan aspek pelanggan dengan aspek teknis di industri otomotif. Penelitian dilakukan dengan menggali sembilan atribut dan 30 level variasi desain produk yang meliputi aspek performa, teknologi, dan pelayanan kendaraan listrik seperti daya dan torsi maksimum; jangkauan maksimum; model kendaraan; kapasitas baterai; kecepatan pengisian baterai; umur baterai yang diharapkan; fitur teknologi dan harga kendaraan. Didapatkan 32 variasi desain yang menggabungkan sembilan atribut dan 30 level desain produk. Melalui metode penerapan fungsi kualitas sadar lingkungan (ECQFD), desain produk yang diperoleh diwujudkan sebagai strategi produksi untuk mendapatkan desain kendaraan listrik yang paling sesuai dengan preferensi pelanggan.

.....The increase in carbon emissions by the transportation sector is correlated with the rise in the number of vehicles in Indonesia, especially vehicles with internal combustion engines which reaches at least 30% of the total national carbon emissions. Carbon emissions cause environmental damage, prompting the Indonesian government to implement a carbon emission policy on ICE vehicles, and the adoption of electric-based vehicle. However, the customers' adoption rate is still limited, partly due to the limited choice of electric vehicles products in Indonesia and unit prices, which are still relatively expensive. This paper intends to explore the design of electric vehicles by paying attention to customer needs to obtain product designs that are most in-demand and most likely to be realized by the related industry. For this purpose, the integration of conjoint analysis (based on full combination model) and environmentally conscious quality function deployment (QFD) methods is carried out, helpful in connecting customer aspects with technical aspects in the automotive industry. The research was conducted by exploring nine attributes and 30 levels of product design variations covering performance, technology, and service aspects of electric vehicle such as maximum power and torque; maximum range; vehicle model; battery capacity; battery charging speed; expected battery life; technology features and vehicle price. 32 design variation obtained which combining

nine attributes and 30 product design level. Through environmentally conscious quality function deployment (ECQFD) method, the product design obtained is realized as a production strategy to obtain an electric vehicle design that best suits customers' preferences