

Electric Motorcycle Market Projection Based on Subsidy and Incentive Policies in Indonesia

Roni Zakaria Raung¹⁾, Wahyudi Sutopo²⁾, Muhammad Hisjam³⁾

1,2,3)Teknik Industri, Fakultas Teknik, Universitas Sebelas Maret Surakarta,
Jl. Ir. Sutami, 36A, Surakarta, Jawa Tengah,
57126 Indonesia

Djoni Hartono⁴⁾

4)Departemen Ekonomi, Fakultas Ekonomi dan Bisnis, Universitas Indonesia,
Pondok Cina, Kecamatan Beji, Kota Depok, Jawa Barat,
16424 Indonesia

ronizakaria@staff.uns.ac.id , wahyudisutopo@staff.uns.ac.id,
hisjam@staff.uns.ac.id, djoni.hartono@ui.ac.id

Abstract

The Paris Agreement involves 195 countries, including Indonesia, that have signed the agreement to commit to reducing the number of carbon emissions that cause climate change. Under the agreement, Indonesia has committed to reducing around 29% to 41% of total carbon emissions by 2030 by environmentally friendly transition technology. The Minister of Industry has targeted a total national production for electric motorcycles in 2030 of 2 million vehicles. As a government effort to achieve this target, the government issued some subsidies and incentives policy. The policy is contained in Presidential Regulation Number 55 of 2019 concerning the Acceleration of the Battery-Based Electric Motor Vehicle Program for Road Transportation which is the highest policy basis and has resulted in several policies from the technical ministries under it. This study aims to determine the effectiveness of subsidy and incentive policies through a market projection model for electric motorcycles. Market projections are carried out using dynamic system modeling by the technology transition by considering 4 factors (users, manufacturers, infrastructure, authorities) which are believed to affect the willingness to consider (WTC) of the user to buy electric motorbikes. The model refers to Powertrain Technology Transition Market Agent Model (PTTMAM) and uses Powersim Studio 10 simulation software. This study simulates 19 subsidy and incentive policies in Indonesia, including 11 subsidy and incentive policies for manufacturers, 6 for users, and 2 for infrastructure providers. The results of the simulation show that market projections are believed to influence consumer considerations in purchasing electric motorcycle vehicles in Indonesia.

Keywords

Dynamic System, Technology Transition, Market Projection, Subsidy & Incentive Policy, Electric Motorcycle.

Biographies

Roni Zakaria is currently a doctoral student in Industrial Engineering Department. Faculty of Engineering, Universitas Sebelas Maret. He is also a lecturer at Department of Industrial Engineering, Faculty of Engineering, Universitas Sebelas Maret since 2000. He earned his Bachelor and Master Degree in Industrial Engineering from Institut Teknologi Bandung. His research interests are business management, strategic management and organizational behavior. He published some papers in journals and proceedings his research area. He is a member of PII (Indonesian Professional Engineer Association) and IEOM (Industrial Engineering and Operations Management).

Wahyudi Sutopo is a professor in industrial engineering and coordinator for the research group of industrial engineering and techno-economy (RG-RITE) of Faculty Engineering, Universitas Sebelas Maret (UNS), Indonesia. He earned his Ph.D. in Industrial Engineering & Management from Institut Teknologi Bandung in 2011. He is also a researcher for the university center of excellence for electrical energy storage technology (UCE-EEST). He has done

projects with Indonesia endowment fund for education (LPDP), sustainable higher education research alliances (SHERA), MIT-Indonesia research alliance (MIRA), PT Pertamina (Persero), PT Toyota Motor Manufacturing Indonesia, and various other companies. His research interests include logistics & supply chain management, engineering economy, cost analysis & estimation, and technology commercialization. He is a member of the board of industrial engineering chapter - the institute of Indonesian engineers (BKTI-PII), Indonesian Supply Chain & Logistics Institute (ISLI), Society of Industrial Engineering, and Operations Management (IEOM), and Institute of Industrial & Systems Engineers (IISE).

Muhammad Hisjam is a lecturer at Department of Industrial Engineering, Faculty of Engineering, Universitas Sebelas Maret since 1998. He earned Bachelor in Agroindustrial Technology from Universitas Gadjah Mada, Master in Industrial Engineering & Management from Institut Teknologi Bandung and Ph. D in Environmental Science from Universitas Gadjah Mada. His research interests are supply chain, logistics, business and sustainable development. He published some papers in journals and proceeding his research area. He holds Accredited Supply Chain Analyst from American Academy of Project Management. He is the Head of Logistics System and Business Laboratory, Faculty of Engineering, Universitas Sebelas Maret. He is a member of IISE, AAPM and IEOM.

Djoni Hartono is a Professor at the Department of Economics, Faculty of Economics and Business, Universitas Indonesia. He received his B.S. degree in mathematics from Bogor Agricultural University, while his Master and Ph.D. degrees in economics were obtained from Universitas Indonesia. He teaches several subjects such as mathematical economics, econometrics, energy economics, regional economics, and economic modelling. His research interests cover the economy-wide impact of energy policies as well as regional and economic development. His another specialty is on the computable general equilibrium modelling. He also has published academic articles in reputable journals such as Energy for Sustainable Development; Energy Policy; International Journal of Urban Sciences; Energy Sources Part B: Economics, Planning, and Policy; Renewable and Sustainable Energy Reviews; Environmental Economics and Policy Studies; Renewable Energy; Review of Urban and Regional Development Studies; International Journal of Development Issues; International Journal of Energy Sector Management; and Asian Economic Journal.