2023 Asia and Pacific Mathematical Contest in Modeling

Problem C

The Development Trend of New Energy Electric Vehicles in China

New energy vehicles refer to vehicles with advanced technical principles, new technologies and new structures, which use unconventional vehicle fuel as their power source (unconventional automotive fuels refer to fuels other than gasoline and diesel) and integrate advanced technologies in vehicle power control and drive. New energy vehicles include four major types: hybrid electric vehicles, pure electric vehicles, fuel cell electric vehicles, and other new energy vehicles. As a type of new energy vehicle, new energy electric vehicles have achieved rapid development in recent years due to their properties of low pollution, low energy consumption, and ability to regulate peak electricity consumption. New energy electric vehicles, including electric buses and family electric cars with less than 7 seats, have been popular with consumers and governments around the world.

Since 2011, the Chinese government has actively promoted the development of new energy electric vehicles and formulated a series of preferential policies. The new energy electric vehicle industry has achieved tremendous development, gradually becoming another Chinese symbol after the "China High Speed Railway". Now your team is invited to complete the following questions：

Question 1: Analyze the main factors that affect the development of new energy electric vehicles in China, establish a mathematical model, and describe the impact of these factors on the development of new energy electric vehicles in China.

Question 2: Collect industry development data on China's new energy electric vehicles, establish a mathematical model to describe and predict the development of China's new energy electric vehicles in the next 10 years.

Question 3: Collect data and establish a mathematical model to analyze the impact of new energy electric vehicles on the global traditional energy vehicle industry.

Question 4: Some countries have formulated a series of policies targeted to resist the development of new energy electric vehicles in China. Establish a mathematical model to analyze the effects of these policies on the development of new energy electric vehicles in China.

Question 5: Analyze the impact of the electrification of new energy electric vehicles (including electric buses) in cities on the ecological environment. Assuming that there is an urban population of 1 million, provide the calculation results of the model.

Question 6: Based on the conclusion of question 5, write an open letter to the citizens to publicize the benefits of new energy electric vehicles and the contributions of the electric vehicle industry in various countries around the world.