

Electric Vehicles and Minicars

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1. INTRODUCTION

A: Hello, everyone! We are from Wakayama Kosen. I'm Kanon. I belong to the Electrical and Computer Engineering department.

B: I'm Yu, I'm in the Intelligent Mechanical Engineering department.

C: I'm Momoka from the Intelligent Mechanical Engineering department, too.

Today, we will talk about the future of electric vehicles. Well, what do you think of when you hear the term "electric vehicle"? In short, there are two types, "battery electric vehicles" (BEVs) and "plug-in hybrid electric vehicles" (PHEVs). In this presentation, we will use the term "electric vehicle" to mean a BEV, that is, a fully electric car using no gasoline.

A: As you know, those vehicles are seen as the next generation of cars. In particular, they are indispensable in terms of reducing CO₂. However, in Japan they are not very popular, and only 0.9 % of cars are BEVs.

B: Yes, although the Japanese government has encouraged the adoption of electric vehicles, there has been little success. We have investigated some of the reasons for their unpopularity. In our presentation, we will explain them and show you our solutions.

2. ADVANTAGES AND DISADVANTAGES OF EVS

C: Well, to begin with, the advantages and disadvantages of electric vehicles need to be introduced. Kanon, would you tell us about their advantages?

A: OK. First, the carbon dioxide emissions when driving are zero. Second, gasoline, which is a fossil fuel, is no longer necessary. Third, the electric power stored in the batteries of electric vehicles can also be made use of during disasters. Fourth, the total running costs for electric vehicles are a half those of gasoline cars. And finally, they are very quiet because they have no noisy engines or mufflers.

C: Sounds great! So, Yu, what are their disadvantages?

B: Well, first, there are some environmental concerns. CO₂ is emitted during the production of BEVs, and the electricity used to charge them is often produced from fossil fuels. Also, since the closure of nuclear plants after the Fukushima Disaster, Japan has struggled to produce enough electricity, especially at peak times. Charging millions of EVs would make this problem worse. Then, there is the problem of cobalt, a metal used in batteries, which is often mined by children in the Congo Republic. Lastly, the disposal of used lithium batteries causes environmental pollution.

A: In addition, there are practical concerns. Electric vehicles have a limited range and they take several hours to charge. What is worse, electric vehicles cost much more to buy than equivalent gasoline cars.

Despite this, the government of Japan has decided that by 2035 all new cars sold must be BEVs or PHEVs. Given these disadvantages, it will not be an easy target to

achieve.

3. THE POPULARIZATION OF EVS

C: Well, as we mentioned, electric vehicles do have some drawbacks. However, companies around the world are developing electric vehicles, and they will gradually improve. On the other hand, as Kanon said, they are still not popular in Japan. So, how should we rethink electric vehicles to make them more popular here?

B: From the consumer's point of view, male drivers tend to like large and fancy cars, and female drivers prefer cars that can fit into tight spaces and are designed with a natural shape. For drivers with babies, engine noise is also a consideration. Though it may be difficult to make electric vehicles that appeal to men right away, as we can see EVs already have features that are attractive to women.

A: Considering these points, we can see that there are similarities between electric vehicles and conventional minicars, or *kei* cars as they are known in Japan. If we can market well-designed "electric minicars" in the future, people will live more comfortable and environment-friendly lives. Furthermore, since these cars are also appealing to women, we can expect them to sell well.

4. EVS IN WAKAYAMA PREFECTURE: Minicars

B: According to statistics, minicars sell better in western Japan. There are some possible reasons: western Japan has less snow, and is generally less mountainous. Also, people here tend to purchase minicars as a second car.

C: As noted, electric vehicles with the characteristics of minicars could become popular. If so, what if we first try to launch such a type of electric vehicle in western Japan? Can we expect them to sell as well as conventional minicars? As a test case, we will demonstrate how such a car could be introduced in Wakayama prefecture.

A: Actually, Wakayama has some factors suitable for electric minicars. Firstly, because in Wakayama prefecture railroads run mainly along the coast and buses are infrequent, people need cars to get around. Also, in mountain areas roads are narrow and winding, and it is not so far to the next town, so people often prefer minicars. For these reasons, electric minicars would be appropriate to Wakayama.

5. POPULARIZING EVS IN WAKAYAMA PREFECTURE

C: Of course, more advertising campaigns for electric vehicles will be needed. SAKURA, which is an electric minicar produced by Nissan, was often seen on TV and in newspapers. Moreover, in addition to advertising, it is necessary to construct more charging stations. Although there are some in shopping centers and parking lots, there are still not enough.

A: Because Wakayama prefecture is a popular tourist destination, we propose renting out electric cars to visitors. We can offer tourists an opportunity to drive an electric minicar and enjoy every aspect of nature here: the Pacific Ocean, sublime mountains, and clear rivers and hot springs. If charging stations were constructed at tourist spots, visitors could charge their cars while they enjoy each place. What is more, minicars are easy for tourists to drive on the roads in Wakayama.

6. PROBLEMS AND SOLUTIONS

B: In Japan, the uptake of electric vehicles has been held back by such problems as their short range, lack of charging stations, and the lack of electrical generation capacity. Nevertheless, we believe that driving range is not such a big problem for electric minicars, because they are often only used for short journeys or commuting to work. In addition, we can improve the charging infrastructure by constructing charging stations at popular destinations.

C: Moreover, as for the shortage of electric power generation, the electricity stored in EVs can be used to power homes and offices when they're not being driven and can actually reduce peak electricity demand. By utilizing their stored electricity, we can help achieve the aims of the seventh SDG: Affordable and Clean Energy.

A: Therefore, we propose introducing electric vehicles to Japan in the form of electric minicars. By initially promoting these vehicles to particular groups, such as women in western Japan, we can gradually increase the number of electric vehicles while keeping electricity consumption within limits.

C: However, don't forget the disadvantages we have mentioned. For example, the environmental pollution caused by lithium batteries, the increase of carbon dioxide emissions during the production of BEVs, and the use of child labor in the Congo Republic. We should continue trying to find solutions to these problems as we sell electric vehicles.

7. CONCLUSION

B: Well, we expect that various cars will be developed in Japan in preparation for 2035. Overcoming the disadvantages of electric vehicles is vital for the future success of the Japanese automobile industry. The next time you and your families choose a new car, you may have the choice of an electric minicar. At that time, we hope this presentation will help you understand what electric vehicles are and, especially, how superb electric minicars are. Thank you.

コメントの追加 [MD1]: I'm not sure what this sentence means. How about changing to:
"We should keep these problems in mind when selling electric vehicles."