Potential for a prevalence of Hydrogen fuel cell vehicles and its issues to be solved

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Introduction

Consider the spreading possibility of Hydrogen Fuel cell Vehicle, which is an effective solution for environmental problems.

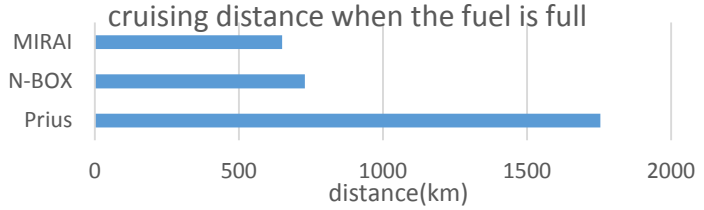
Questions:Can we make Hydrogen fuel cell vehicle widely spread?What is the problem to be solved for its spreading?

Point1 | Point2 | point3 | point4

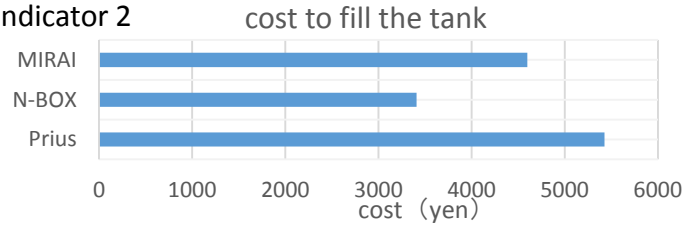
Point1 Whether or not performance meets current demands.

Compare Gasoline Car and Fuel Cell Vehicle
→using 3 indicators

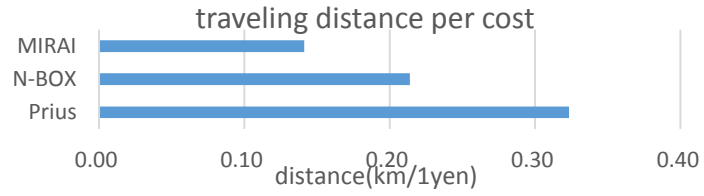
Indicator 1



Indicator 2



Indicator 3



Hydrogen fuel cell vehicle is still inferior to gasoline car, especially its “cost performances” and hard to say it meets the demand.

Point2 Whether or not the number of refueling stations can be sufficient in the future.

How many stations do we need to fulfill the requirement?

→Consider about the conditions by **referring a normal gas station**, and use the following hypotheses.

1. :The number of the gas stations in Japan which is 31,467, is appropriate for use of cars. The number is on “Survey about gas stations 2016” which is published by the Ministry of Economy, Trade and Industry.
2. As the former column shows, hydrogen fuel cell vehicle's cruising distance is about a half of normal car's cruising disance. In this study we will assume that the ratio does not change by the size of the car.

(1) current number of gas station
→31,000 stations
=
about 320 meters between each gas stations

(2) Building Cost
→4 to 5 hundred million yen per station

need some financial help from the government, or from private enterprises

5 to 6 times larger than a normal gas station

A massive amount of money will be needed to cover the disadvantage revealed in the former column which makes it very difficult to fulfill.

Point3 Whether or not non-CO2 producing technologies will come into existence.

Current Technologies
- Steam Reforming Process→Produce CO2
- Pyrohydrolytic Method→require massive amount of energy

New Methods
non-CO2 producing method heating the water to only 500℃ has been developed

There is a non-CO2 producing technology which generates hydrogen and it is almost ready to be used.

Point4 Whether or not we can offer the price low enough for vehicles to be used widely in the society.

MIRAI’s manufacturer’s recommended price
= 7.236 million yen
CEV subsidy -2,020 million yen
501.6 million yen

the standard amount of money which the country sets × subsidy rate (⅔ is the rate for hydrogen fuel battery car)

There is subsidy from the country and the local government, but the price remains to be high and it won’t be the solution of the task in the first column.

Summary

Although the technical problems are already solved, the economic problems are still remained as a big issue

Spreading Possibility:Extremely low
Problem to be solved:Economic Problems

Two solutions

reinforcement of subsidies produced by the government or municipalities

price reduction of equipment construction

= providing subsidy can increase the possibility of success