

## Policy Initiatives That Increase Mass-Market Participation of Fuel Cell Electric Vehicles

**Authors :** Usman Asif, Klaus Schmidt

**Abstract :** In recent years, the development of alternate fuel vehicles has helped to reduce carbon emissions worldwide. As the number of vehicles will continue to increase in the future, the energy demand will also increase. Therefore, we must consider automotive technologies that are efficient and less harmful to the environment in the long run. Battery Electric Vehicles (BEVs) have gained popularity in recent years because of their lower maintenance, lower fuel costs, and lower carbon emissions. Nevertheless, BEVs show several disadvantages, such as slow charging times and lower range than traditional combustion-powered vehicles. These factors keep many people from switching to BEVs. The authors of this research believe that these limitations can be overcome by using fuel cell technology. Fuel cell technology converts chemical energy into electrical energy from hydrogen power and therefore serves as fuel to power the motor and thus replacing heavy lithium batteries that are expensive and hard to recycle. Also, in contrast to battery-powered electric vehicle technology, Fuel Cell Electric Vehicles (FCEVs) offer higher ranges and lower fuel-up times and therefore are more competitive with electric vehicles. However, FCEVs have not gained the same popularity as electric vehicles due to stringent legal frameworks, underdeveloped infrastructure, high fuel transport, and storage costs plus the expense of fuel cell technology itself. This research will focus on the legal frameworks for hydrogen-powered vehicles, and how a change in these policies may affect and improve hydrogen fueling infrastructure and lower hydrogen transport and storage costs. These policies may also facilitate reductions in fuel cell technology costs. In order to attain a better framework, a number of countries have developed conceptual roadmaps. These roadmaps have set out a series of objectives to increase the access of FCEVs to their respective markets. This research will specifically focus on policies in Japan, Europe, and the USA in their attempt to shape the automotive industry of the future. The researchers also suggest additional policies that may help to accelerate the advancement of FCEVs to mass-markets. The approach was to provide a solid literature review using resources from around the globe. After a subsequent analysis and synthesis of this review, the authors concluded that in spite of existing legal challenges that have hindered the advancement of fuel-cell technology in the automobile industry in the past, new initiatives that enhance and advance the very same technology in the future are underway.

**Keywords :** fuel cell electric vehicles, fuel cell technology, legal frameworks, policies and regulations

**Conference Title :** ICMSE 2020 : International Conference on Materials Science and Engineering

**Conference Location :** New York, United States

**Conference Dates :** April 23-24, 2020