Syllabus subtopic: Science and Technology- developments and their applications and effects in everyday life Achievements of Indians in science & technology; indigenization of technology and developing new technology.

News: Ahead of the Tokyo Olympics next July, Japan’s government and its auto industry are jointly making a big bet on hydrogen to power emission-free cars — widely regarded as the next frontier in electric vehicle (EV) technology. And, as Japan strives to put thousands of hydrogen vehicles on its roads ahead of the 2020 sporting event, India could end up riding the slipstream.

Prelims and Mains focus: about Hydrogen fuel cell technology, its use in vehicle and its prospects in the future, India’s efforts to reduce environmental pollution

Background:

The apex court had on November 13 directed the Centre to look into the feasibility of introducing hydrogen-based technology to deal with air pollution in the National Capital Region, with a specific reference made at the last hearing to the ongoing research at Kyushu University.

About the research

Research on hydrogen-based vehicle technology, or fuel cells, done at the International Research Center for Hydrogen Energy at Kyushu University is learnt to be a crucial input in the submissions set to be presented by the Centre in the Supreme Court on December 3.

Government departments in India are learnt to be in touch with researchers at the Fukuoka-based university — Japan’s fourth oldest university — for readying the blueprint to be submitted in court. An executive with the Japanese auto industry confirmed that the Indian government has reached out to the university and is focused on exploring the possibility of operating fuel cell-driven public transport.

The relatively nascent hydrogen market is currently dominated by two of Japan’s top carmakers, Toyota and Honda, alongside South Korea’s Hyundai.

About the Fuel cell

At the heart of the hydrogen-powered fuel cell electric vehicles (FCEV) is what is called a fuel cell, where hydrogen and oxygen are combined to generate an electric current, with water being the only by-product.
About the Japanese project

The project at Kyushu University is supported by Japan’s Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Economy, Trade and Industry (METI), and the New Energy and Industrial Technology Development Organization (NEDO).

According to Professor Kazunari Sasaki, Senior Vice President, Kyushu University and the Director of International Research Center for Hydrogen Energy, the institution is leading “a coordinated effort among industry, academia, government and the local community to build a research and education center for hydrogen energy, the only one of its kind in the world… to contribute to the realisation of a low-carbon society by utilising hydrogen energy technologies”.

Japan had earlier this year announced plans to ramp up its exposure to the hydrogen ecosystem. Prime Minister Shinzo Abe had declared in Davos that his government “aims to reduce the production cost of hydrogen by at least 90 per cent by the year 2050, to make it cheaper than natural gas”.

As a step in bolstering Japan’s hydrogen push, Panasonic Corporation had, last month, announced it had fabricated a hydrogen station in Kusatsu City, Shiga Prefecture with the aim of “verifying the practicality of using hydrogen”.

European firms such as Norwegian public enterprise Enova SF, which is responsible for the promotion of environmentally friendly production and consumption of energy, are already working on the technology separately.

In 2017, Enova issued a support programme to support establishment of hydrogen infrastructure, as well as support for fleet users to purchase H2 vehicles and stations.

Toyota’s Mirai, a hydrogen fuel cell vehicle that is one of the first such vehicles to be sold commercially, counts Norway and Denmark as among its biggest emerging markets, after the state of California in the US.

Note: For more on Hydrogen Fuel cell vehicle market click on the link below