

Nissan planning new fuel-cell vehicle

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The global environment has been afflicted to a considerable extent by the conventional combustion engines of the vehicles, creating certain problems of global interest like exhaust emission, global warming and increased dependence on fossil fuel. (Paul Nieuwenhuis, Peter Wells, 2003)

It has been estimated that fossil fuels are a limited resource. Nissan has always played a key role in automotive industry and foreseen that mobility is an inevitable part of economic development of any country. Nissan has contributed his share by harnessing the technological strengths that has accumulated over many years of its dedication and ever-changing discoveries.

The basic charm in the philosophy of fuel cell vehicle is in its environment friendliness. It is expected to play an ever more important role as a clean energy vehicle. Main feature of fuel cell vehicle is that electrical energy is obtained by the chemical reaction of hydrogen and water. In this reaction sole emission is water which is already the part of ecosystem means least or almost no pollution. The electrical energy obtained in this manner will be utilized to get it converted into mechanical driving force by a number of engineering processes. (Lloyd Dixon, Isaac Porche, Jonathan Kulick, 2002).

The Nissan FCV employs elements of a variety of technologies, including electric vehicle (EV), hybrid electric vehicle (HEV), and compressed natural gas vehicle (CNGV) technologies.

Nissan's FCV applies technologies that have been developed in Nissan, such as lithium ion batteries and high voltage electric systems for electric vehicles, control technologies for hybrid vehicles and high pressure gas

storage systems for CNGV. Nissan has been developing FCVs that endeavors to accomplish outstanding environmental and energy-saving capacity. (Geographical, 2003)

Nissan Canada Inc. (NCI) declared in February 2006, a program that will put its newest fuel cell-equipped vehicle to the test trial for analysis. The new seventy mega Pascal (MPa) high-pressure hydrogen-powered Nissan X-Trail FCV (fuel cell vehicle) was at home in Canada for testing, which will take place in the vicinity of the Greater Vancouver. The Nissan X-Trail FCV encloses a hydrogen fuel cylinder manufactured by Dynetek Industries Ltd. of Calgary, Alta. The important thing about this cylinder is that it has been built in Canada.

The vehicle is under test at Surrey, B. C.-based Powertech Labs Inc., an entirely owned auxiliary of BC Hydro, in collaboration with Fuel Cells Canada. Fuel Cells Canada administers the Hydrogen Highway, a synchronized, large-scale presentation and utilization program intended to accelerate the commercialization of hydrogen and fuel-cell technologies. Nissan joined these organizations in Surrey to start the testing.

" Through Nissan's advances in hydrogen fuel cell technology, we hope to improve the practicality of fuel cells as a future clean power source,"

These are the words uttered by John Junker-Andersen, Director, Parts, Service and Quality Assurance at NCI. He further added,

" Together with the assistance of Powertech and BC Hydro, we are working hard to make the benefits of fuel cells and their promise of high efficiency and zero emissions a viable reality."

A fuel cell vehicle is in consequence an electric vehicle, using a fuel cell to alter hydrogen and oxygen into electricity. The electricity is produced by a chemical reaction inside the fuel cell stack when hydrogen from the fuel cylinder merges with oxygen in air. The only by-product is water, making FCVs completely emissions-free. Robb Thompson, Dynetek Industries Ltd said,

" With partners such as Nissan and BC Hydro, we are able to test compressed hydrogen in real world situations,"

" Through these tests, we have demonstrated that compressed hydrogen is the best commercially suitable alternative for the success of the hydrogen economy."

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Nissan will test the vehicle in a number of environments and drive cycles, including moderate cold-weather, high-speed hill climbs and highway driving, to evaluate the vehicle's capabilities and the hydrogen fuel system's performance.

Livio Gambone, Manager, Vehicle Programs at Powertech said,

" As members of the Hydrogen Highway(TM), we are pleased to support Nissan's vehicle testing program,"

" Our climate and geography, plus access to our seventy MPa hydrogen filling station, make the Vancouver area the best and only place to test the viability and endurance of this FCV."

The seventy MPa high-pressure hydrogen-powered Nissan X-Trail FCV is the company's most-recent developmental fuel cell vehicle. Equipped with the first-ever Nissan-constructed fuel cell stack, the X-Trail FCV also boasts a more compact design and increased power. A previous 2003 model offered a cruising range of 350 km, but thanks to improved stack efficiency and a 30 percent increase in the high-pressure Dynetek hydrogen cylinder's storage capacity, the new X-Trail FCV is expected to achieve a cruising range of more than 500 km.

John Tak, President and CEO, Fuel Cells Canada said,

" We applaud Nissan Canada's decision to test their newest hydrogen powered fuel cell vehicle along the Hydrogen Highway(TM)," " As a world-leading centre for hydrogen and fuel cell expertise, British Columbia's Hydrogen Highway(TM) is an ideal proving ground to test and demonstrate these technologies."

Nissan has been working on FCV development since 1996. In addition to design and engineering work conducted in Japan, extensive testing and development has also been conducted in other markets, including the United States, where Nissan is a member of the California Fuel Cell Partnership (CaFCP). About Nissan Canada Inc. Nissan Canada Inc. is the Canadian sales, marketing and distribution subsidiary of Nissan Motor Limited and Nissan North America, Inc. With offices in Vancouver (BC), Mississauga (ON), and Kirkland (QC), Nissan Canada directly employs two hundred and ninety staff, while one hundred and forty six independent businesses hold exclusive Nissan dealerships and twenty nine hold exclusive Infinity dealerships. (Jim Motavalli, 2003).

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Ten years devotion of Nissan for fuel-cell research has evolved as the latest FCV X-Trail sport/utility vehicle. Nissan engineered and assembled a fuel stack in-house and its most recent unit manages to squeeze the stack's sophisticated technology in a smaller and lighter package. The new stack develops 120 horse power—35 horse power more than the one fixed to the previous 2003 FCV X-Trail. As a consequence the new model put forward better linear speeding up and response, higher top speed too.

Fuel cell packaging has gifted the new vehicle with more freed passenger space. The lithium-ion battery pack, that is stored under the trunk floor, is also built smaller, permitting for more goods room. In addition to this the smaller fuel-cell unit releases 40 percent extra space under the front seats.

The considerable egg shaped hydrogen tank, which is lined by aluminium in its inner wall and strengthened with carbon fiber in its outer covering posed substantial packaging problem. Nissan has resolved it by placing it under the rear seats with resultant diminished headroom. The texture of the new tank provides it with greater accommodative capacity imparting thirty percent more hydrogen storage capacity that has a great impact on vehicle cruising mileage, sometimes attaining three hundred and twelve miles.

The vehicle X-trial has been observed efficient on the road. Drive of this car is as easy operative as selective drive and tapping into the zero-emission power once the onboard computer system indicates the green signal. Nissan has manufactured the FCV X-trail to bestow the drivers a feeling of normal driving experience a part from the apparent lack of a noxious exhaust. In fact the car is being propelled by the electrical energy generated as a result

of discussed chemical reaction. Since a train-like motor sound is audible from the background, however it is never annoying. (Robert L. Olson, 2003).

The X-Trail accelerates readily up to a seventy mile per hour cruising speed and easily achieves a ninety three miles per hour top speed.

Japanese government has approved public road testing and leasing of the Nissan's latest fuel cell vehicles due to Nissan's determined hard work and research in the field of fuel cell technology. Let us see when Nissan markets its matchless vehicle for the use of consumers.

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