NISSAN
MOTOR COMPANY

X-TRAIL FCV – Nissan's fuel cell vehicle for the future features the first in-house developed cell stack, helping to promote a cleaner environment

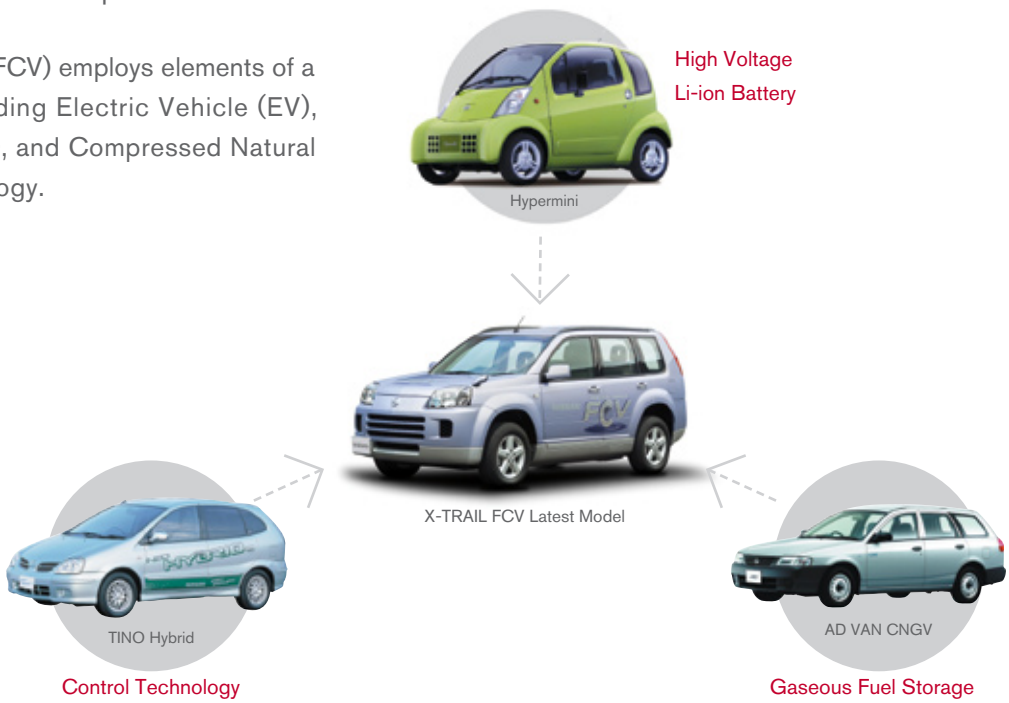
The Nissan X-TRAIL FCV high-pressure hydrogen-powered fuel cell vehicle (FCV) delivers plenty of clean power, with no harmful emissions. After being approved by the Japanese Minister of Land, Infrastructure and Transport in November 2002, Nissan made further improvements to the concept and produced the 2003 model, unveiled in December of that year. Cosmo Oil Co. Ltd leased the first example in March 2004 and Kanagawa prefecture and Yokohama city leased examples in April 2004. The next version used the self-developed fuel cell stack and was introduced in December 2005. This development is in line with the "Nissan Green program", an environmental action plan focusing the company's effort in technological development, recycling strategy and many other initiatives.

NISSAN
GREEN PROGRAM

Creative technology to attain the Nissan Environmental Philosophy "Symbiosis of people, vehicles, and nature."

Features of Nissan's FCV Development

The Nissan Fuel Cell Vehicle (FCV) employs elements of a variety of technologies, including Electric Vehicle (EV), Hybrid Electric Vehicle (HEV), and Compressed Natural Gas Vehicle (CNGV) technology.



Clean vehicles with advanced fuel cell technologies.

History of Nissan's FCV Technology Development

1996 — **Started FCV technology development**

1999 May — Started driving tests of FCV

Nissan started driving tests of its first fuel cell vehicle "R'NESSA FCV", equipped with a methanol reformer to extract hydrogen from liquid methanol.

R'NESSA FCV (Methanol Reformer)

2000 March — Joined the CaFCP

Nissan joined the California Fuel Cell Partnership (CaFCP), a collaboration of auto manufacturers, energy providers, government agencies and fuel cell technology companies, to promote the commercialization of FCVs.

2001 April — Started public road tests in California

In 2001, Nissan entered into a five-year, 85 billion yen alliance with Renault to develop fuel cell technologies.In April, Nissan started public road tests of XTERRA FCV in Sacramento, California. XTERRA FCV was Nissan's first FCV to run on compressed hydrogen gas.

XTERRA FCV (Direct Hydrogen)

2002 July — Joined the JHFC

Nissan joined the Japan Hydrogen & Fuel Cell Demonstration Project (JHFC), directed by Japan's Ministry of Economy, Trade and Industry.

December — Started public road tests in Japan

Nissan X-TRAIL FCV 2002 Model got certification from Japan's Ministry of Land, Infrastructure and Transport to conduct public road tests in Japan.

X-TRAIL FCV 2002 Model (Direct Hydrogen)

2004 March — Leased 2003 model X-TRAIL in Japan

Nissan leased X-TRAIL FCV to Cosmo Oil Co., Ltd. In April, Nissan leased X-TRAIL FCV to the Prefecture of Kanagawa and the City of Yokohama respectively, to collect data on a daily basis, under normal operating conditions.

X-TRAIL FCV 2003 Model (Direct Hydrogen)

2005 December — Announced the leasing of X-TRAIL FCV

The newest X-TRAIL model is powered by the self-developed fuel cell stack. It is smaller, and provides higher efficiency and generates more power compared to the previous fuel cell stack. In April 2006, the Prefecture of Kanagawa and the City of Yokohama each took delivery of this new model.

X-TRAIL FCV Latest Model (Direct Hydrogen)

2006 April — Started FCV Driving Experience Program

Nissan started the FCV Driving Experience Program at its headquarters in Ginza Tokyo, to obtain additional feedback from real-world drivers.

2007 February — Started world's first fuel-cell limousine service

Kanagawa Toshi Kotsu Ltd. took delivery of the new X-TRAIL FCV to start the world's first fuel cell limousine service. Nissan and Kanagawa Toshi Kotsu Ltd. will work together to demonstrate the performance and benefits of the FCV clean technology in commercial use.

Public Road Tests in U.S.A. and Japan

U.S.A.

California Fuel Cell Partnership

www.fuelcellpartnership.org

Japan

JHFC Japan Hydrogen & Fuel Cell Demonstration Project

www.jhfc.jp

Because of CaFCP and JHFC outstanding efficiency and zero-emission performance, fuel cells are regarded as a promising mainstream power source for vehicles in the future. Issues to be addressed to support their widespread use include cost reductions and development of the necessary fuel supply infrastructure. Resolving these and other related issues will take some time. Nissan has been conducting public road tests in U.S.A. and Japan to tackle these issues in anticipation of the popularization of FCV in the future.

Key features of the Nissan X-TRAIL FCV

Adoption of in-house fuel cell stack

With about twice the volume-to-power and weight-to-power ratios of the stack used in the 2003 model, Nissan's own compact fuel cell stack develops 90kW, enough for a top speed of 150km/h.

70MPa high-pressure storage cylinder

By doubling the pressure under which hydrogen is stored (from 35MPa in the 2003 model), the FCV's cruising range has increased to 500kms, about 1.4 times better than before.

Compact Lithium-Ion battery

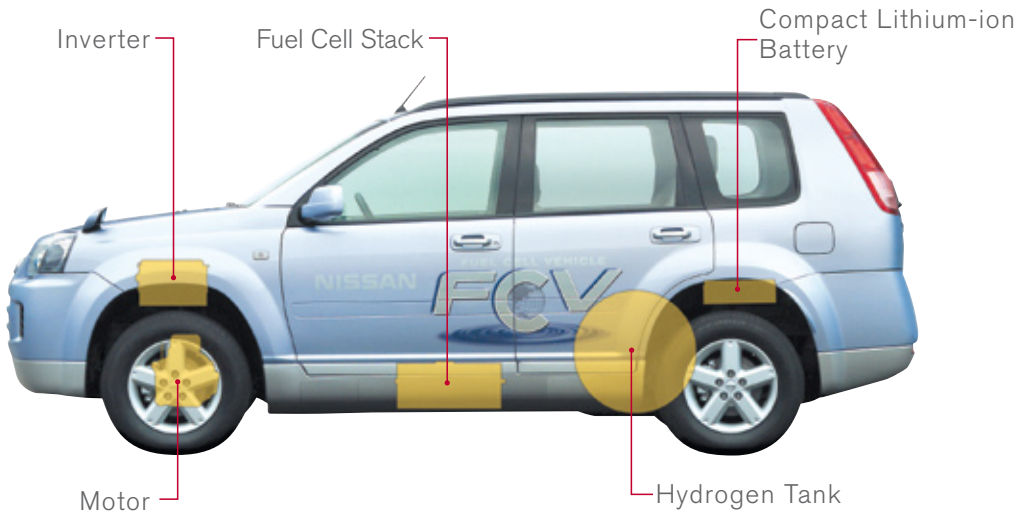
By adopting the highly efficient and space saving thin laminated Li-Ion battery cell in place of a conventional cylindrical cell, there's a substantial improvement in interior space efficiency.

Performance improvements

The performance and practicality of the Nissan FCV has been improved with a higher top speed – up from 145km/h to 150km/h – cruising range rising to 370km from 350km (35MPa version) and more than 400mm of extra luggage space.

Overview of the X-TRAIL FCV

(1) Layout



(2) Specification

			The Latest Model
Vehicle	Overall length/width/height	[mm]	4485/1770/1745
	Vehicle weight	[kg]	1790 (1860)
	Seating capacity	[people]	5
	Top speed	[km/h]	150
	Cruising range	[km]	Over 370 (over 500)
Motor	Type		Coaxial motor integrated with reduction gear
	Max. power	[kW]	90
	Max. Torque	[N ▪ m]	280
Fuel cell stack	Fuel cell		Polymer electrolyte type
	Max. power	[kW]	90
	Supplier		Developed by Nissan
Battery	Type		Compact Lithium-ion Battery (Laminate type)
Fueling system	Fuel Type		Compressed hydrogen gas
	Max. pressure	[MPa]	35 (70)

Figures in parentheses refer to FCV equipped with 70MPa high-pressure, hydrogen storage cylinder.

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