



### **Fuel Cell Vehicle Development in NISSAN**

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# **Direction of Environmental Technologies**

Aiming for clean exhaust emissions with low fuel consumption, Nissan is engaged in R&D activities to improve internal combustion engines and to develop electrified vehicles powered by electric motors.



## **NISSAN FCV Technology Development**

1996: Start FCV Technology Development

May, 1999: Actual driving test



Methanol FCV (Methanol Reformer)
Dec., 2002: Start public road test in Japan



X-trail FCV .Direct Hydrogen)

 Mar.,2000: Join CaFCP
 Apr.,2001: Start public road test in USA



Xterra FCV (Direct Hydrogen)

## **Development Schedule**

• A few FCVs will be leased to specified customers in Japan in FY2003.

01FY	02FY	03FY	04FY	05FY
<image/>	X-TRAIL FCV 2002 .Certification of NILIT .Participation in JHFC	2 model X-TRAIL FCV 200 .Leasing in Japan	)3 model Evoluti	on every year

# **Basic Technologies of FCV**

Nissan's FCV is based on various technologies such as high voltage motor & inverter and battery(EV), hybrid energy control system(HEV) and gaseous fuel storage (CNG).



# Hypermini



## Tino HYBRID

(1)Engine (2)Hyper CVT (3)Motor A (4)Motor B (5)Li-ion Battery (6)Electromagnetic Clutch (7)Inverter



#### **Neo HYBRID System**

### AD VAN CNG



# X-TRAIL FCV 2002 model



## X-TRAIL FCV 2002 model Specifications

	Length / Width / Height (mm)	4465 / 1765 / 1790	
Vehicle	Seating Capacity (passengers)	5	
	Max. Speed (km/h)	125	
Motor	Туре	Motor & gear integrated Powertrain	
	Max. Power (kW)	58	
Fuel Cell Steek	Fuel Cell Type	Polymer Electrolyte	
Fuel Cell Stack	Supplier	<b>UTC Fuel Cells (USA)</b>	
Secondary Battery	Туре	Li-ion Battery	
Fuol	Fuel Type	Compressed Hydrogen	
Fuel	Max. Pressure (MIPa)	35	

# **Certification from the MLIT in Japan**

Nissan X-TRAIL FCV 2002 model has been certified by the Ministry of Land Infrastructure and Transportation(MLIT) in November, 2002.



# X-TRAIL FCV 2003 model Development

Nissan has developed X-TRAIL FCV 2003 model much evolving from 2002 model.

- The objectives of this model are improving performance and system downsizing.
- Nissan will start leasing them to specified customers in Japan in FY2003.

#### Main Features

Following technologies are installed in X-TRAIL FCV 2003.

- New model fuel cell stack with high efficiency
- In-house high power motor & inverter
- Compact Lithium-ion battery

# **Compact Lithium-ion Battery**

Power density of the laminate type battery is 2 times better than that of the cylindrical type. It contributes to space utility.



### X-TRAIL FCV 2003 model

Nissan will lease new X-TRAIL FCV to specified customers in FY2003.



Specifications will be released

