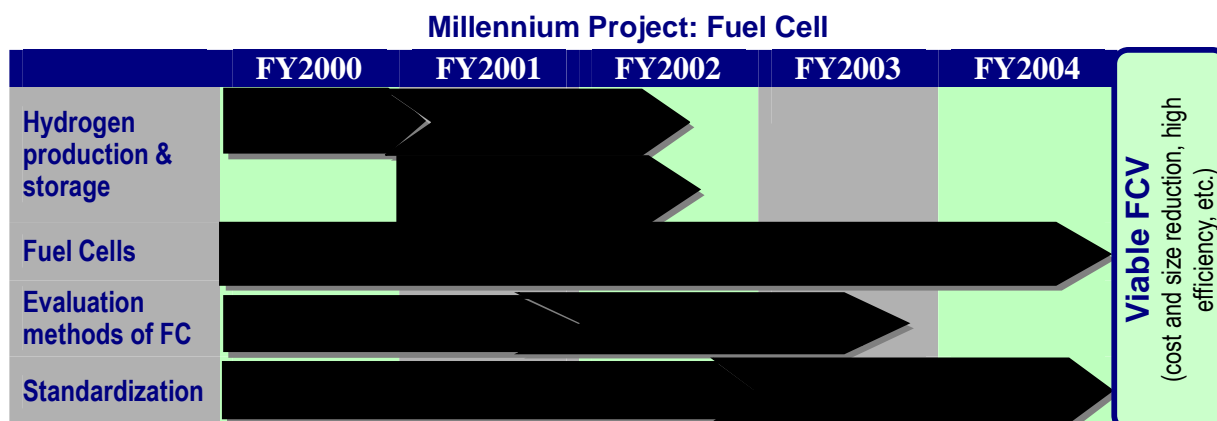


# Fuel Cell Vehicle Policies

To make fuel cell vehicles viable, it will still take great efforts toward technological and economical improvement of fuel cells and vehicle, development of fuels and infrastructure, preparation of legislation, standardization, etc. The government has been committed to fuel cell vehicles conducting basic researches and demonstrations, and to prepare the social framework and infrastructure for the common interests. The New Sunshine Project was a national project for the development of energy and environment related technologies, started in 1993 funded by the METI. Under this umbrella project, fuel cells of various types including phosphoric acid fuel cell, molten carbonate fuel cell, solid oxide fuel cell and polymer electrolyte fuel cell have been developed targeting in 2003 for viable performance. In 2002, fuel cell related programs funded by the METI were restructured as the Polymer Electrolyte Fuel Cell and Hydrogen Energy Utilization Program.

## FC Introduction under the Millennium Project

The national Millennium Project aimed Japan's industrial renovation in the 21<sup>st</sup> century focusing on the environment, information technology and welfare for the aged, and fuel cell was selected as one of the innovative technologies to be promoted. The ultimate objective of fuel cell project was to introduce viable fuel cell cogeneration system including fuel cell vehicles by the year 2005. Project scenario contains the analysis of potential fuels for fuel cell vehicles in 2001; preparation of evaluation methods and standard specifications of fuel cells in 2002; practical technology accomplishment in 2004; and, commercialization and mass production in 2005. According to the report of the strategy study meeting for fuel cell commercialization, advisory meeting for the Director General of the Agency of Natural Resources and Energy, the phase of initiative introduction will be from 2005 to 2010 when 50,000 FCVs are expected to be introduced to public utilities and FC related companies. The fuel cell vehicle will then enter on the phase of diffusion when its market will develop autonomously on the basis of the completed fuel supply structure and cost reduction. The report targets 5 million FCVs on the road in 2020.



### WE-NET Project

World Energy Network (WE-NET) program, a component of the New Sunshine project, aimed the establishment of a global clean energy network of hydrogen fuels produced from renewable energies. WE-NET project included the researches and development of technologies in terms of the production, distribution and refueling of hydrogen for FCVs. In fiscal 2003, this project was integrated into the demonstration study on polymer electrolyte fuel cell system including the JHFC project.



WE-NET Hydrogen Station in Osaka

Phase I	Phase II
<b>FY1993 ~ FY1998</b>	<b>FY1999 ~ FY2003</b>
<ul style="list-style-type: none"> <li>➤ Development of H<sub>2</sub> production, distribution and storage technology</li> </ul>	
<ul style="list-style-type: none"> <li>➤ Concept planning of overall system</li> <li>➤ Researches on technologies using H<sub>2</sub>, etc.</li> <li>➤ Development of H<sub>2</sub> fuel turbine, etc.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Development of H<sub>2</sub> refueling station, H<sub>2</sub> vehicle system, PEFC, H<sub>2</sub> absorbing alloy, etc.</li> <li>➤ Researches on system evaluation, safety issues, etc.</li> </ul>

### Polymer Electrolyte Fuel Cell and Hydrogen Energy Utilization Program

This synthesized program funded by the METI is the largest national efforts currently conducted in Japan for the commercialization of fuel cell vehicles and stationary fuel cells. The program covers 11 projects including the development, demonstration studies, and standardization for fuel cell, fuel cell vehicles, hydrogen, hydrogen refueling facilities, and other peripheral technologies. The total budget was 17.6 billion yen in FY2002, and for FY2003, 22.5 billion yen was requested. Major components are shown below.

<b>Development of Polymer Electrolyte Fuel Cell System Technologies</b>	
<i>Period</i>	FY2000-FY2004
<i>Undertaken by</i>	New Energy and Industrial Technology Development Organization (NEDO)
<i>Objectives</i>	Development of element technologies and material technologies comprising fuel cells, as well as systematization technologies, mass production technologies, and cost reduction technologies, aimed at the commercialization and widespread use of fuel cells
<b>Development of Basic Technologies for the Safe Use of Hydrogen</b>	
<i>Period</i>	FY2003-FY2007
<i>Undertaken by</i>	NEDO
<i>Objectives</i>	Establishment of safety technologies, by gathering the data necessary to verify the safety of hydrogen, and development of auxiliary equipment, such as the compressor, necessary to develop the hydrogen fuel infrastructure, in order to establish technologies for safe and low-cost manufacturing and use of hydrogen, aimed at the widespread use of fuel cells in the initial stage

<b>Demonstration Study on Polymer Electrolyte Fuel Cell Systems</b>	
<i>Period</i>	FY2002-FY2004
<i>Undertaken by</i>	Japan Automobile Research Institute (JARI) Engineering Advancement Association of Japan (ENAA) New Energy Foundation
<i>Objectives</i>	Public-road testing of fuel cell vehicles, including the demonstration of fuel stations, and operational testing of stationary fuel cell cogeneration systems under actual use conditions while taking into account technological advancements, in order to gather fundamental information necessary for development and widespread use  <div style="background-color: #e0f7fa; padding: 5px;"> <p><b>Japan Hydrogen &amp; Fuel Cell Demonstration Project (JHFC Project)</b></p> <ul style="list-style-type: none"> <li>• Fuel Cell Vehicle Demonstration Study <span style="float: right;"><i>Undertaken by JARI</i></span></li> <li>• Demonstration Study of Hydrogen Refueling Facilities <span style="float: right;"><i>Undertaken by ENAA</i></span></li> </ul> </div>
<b>Projects for Development of Infrastructures for Widespread Use of Polymer Electrolyte Fuel Cell Systems</b>	
<i>Period</i>	FY2000-FY2004
<i>Undertaken by</i>	NEDO
<i>Objectives</i>	Data gathering, establishment of evaluation methods, and proposal of draft criteria and standards through evaluation testing aimed at developing the infrastructure, such as safety and reliability criteria and standards that will be required in the stages of commercialization and widespread use of fuel cells

## **JAPAN HYDROGEN & FUEL CELL DEMONSTRATION PROJECT**

The Japan Hydrogen and Fuel Cell Demonstration project consists of a FCV Demonstration Study and a Demonstration Study of Hydrogen Fueling Facilities. Both studies are among the polymer electrolyte fuel cell research projects subsidized by the METI. The JHFC project aims to gather and share fundamental data on the methods for producing hydrogen from various fuels and the performance of FCVs under conditions of actual use in order to develop a roadmap to the full-scale mass production and widespread use of fuel cell vehicles. The project is the first extensive FCV demonstration study in Japan. In fiscal 2003, seven auto manufacturers are testing respective FCVs on public roads. Also, Japan's first fuel cell public bus started operation in Tokyo under this project. The project is also the first study in the world to operate different types of hydrogen refuelling facilities to validate different types of fuels, refueling data, and issues to be solved for the diffusion of fuel cell vehicles. Hydrogen is produced at respective stations by reforming LPG, desulfurized gasoline, methanol, and naphtha. Technologies for producing liquefied hydrogen from a steelmaking by-product gas will also be developed and validated.

**"FOR THE NEXT GENERATION: EV, HEV & FCV" JARI, Oct. 2003**



Period	April 2002 – March 2005	
Goals	<ul style="list-style-type: none"> <li>• To clearly show the energy-saving effect of FCVs and hydrogen refuelling facilities</li> <li>• To clearly show how FCVs and hydrogen refuelling facilities have a beneficial effect on the environment</li> <li>• To acquire data useful to develop laws and regulations, and standards for the safety and other related issues of FCVs and hydrogen storage facilities</li> <li>• To raise public awareness regarding FCVs and hydrogen storage facilities</li> <li>• To clarify issues to be solved so that the number of FCVs and hydrogen storage facilities can increase</li> <li>• To develop and demonstrate technologies of efficiently recovering surplus hydrogen and liquefying it so that hydrogen can be transported</li> </ul>	
Vehicles	Direct hydrogen type fuel cell vehicles	
2003 Participating companies	Toyota Motor Corp. Nissan Motor Co., Ltd. Honda Motor Co., Ltd. Daimler Chrysler Japan GM Asia Pacific Japan Mitsubishi Motors Corp. Suzuki Motor Co. Nippon Oil Corporation Cosmo Oil Co., Ltd. Showa Shell Sekiyu, K.K. Tokyo Gas Co., Ltd. Iwatani International Corp.	Japan Air Gases Nippon Sanso Corp. Nippon Steel Corp. Hino Motors, Ltd. Kurita Water Industries Ltd. Sinanen Co., Ltd. Itochu Enex Co., Ltd. Idemitsu Kosan Co., Ltd. Babcock-Hitachi K.K. Tsurumi Soda Co., Ltd.

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