



Brazilian Fuel Cell Bus

PARTNERS:

MME – Ministry of Mines and Energy is the executing agency. The Brazilian Fuel Cell Bus project is included in the Federal Government's policy of Hydrogen introduction in the Brazilian energy spectrum, which is coordinated by the Ministry, under the Secretary of Oil, Natural Gas and Renewable Fuels.

EMTU – São Paulo Metropolitan Urban Transport Company, linked to the Secretary of Metropolitan Business of the São Paulo' State, is the Implementing Agency.

The EMTU/SP is one of the largest urban transit authorities in the country, working in three metropolitan regions of São Paulo State: RMSP (Grande São Paulo, with 39 cities), RMBS (Baixada Santista, with 9 cities) and RMC (Campinas, with 19 cities). The company controls approx. 5 thousand intercity buses of the regular system, transporting 50 million passengers per month.

The EMTU/SP has developed an environmental policy to apply in its transportation system and the Brazilian Fuel Cell Bus Project is within this policy.

UNDP – the United Nations Development Programme is GEF's Implementing Agency. The UNDP works in the administrative support to this project and its Environment, Energy, Science and Technology Unit has received and successfully forwarded the project's study, project's approval and project's financing to the GEF, which is the international financing agency in the benefit of the environment.

The financing has been conceived by the GEF because of the environmental concept of this project, which vehicle emission is zero and in addition the hydrogen, vehicle fuel, will be produced by electrolysis, using the electricity produced by a renewable source, because more than 90% of the electricity, which is produced in Brazil come from hydro-power.

GEF – Global Environment Facility is the Multilateral Financing Mechanism. For this project this resources have been given to the UNDP and administrated by them. The amount destined to this project was US\$ 12.3 million.

FINEP – Financing Agency of Studies and Projects is the National Sponsor Agency, which belongs to the Ministry of Science and Technology. For this project its resources have been given to the MME - Secretary of Oil, Natural Gas and Renewable Fuels, which itself forward to the UNDP, which administrates those resources. The amount of money destined to this project was US\$ 3.3 million.



CONSORTIUM MEMBERS:

AES ELETROPAULO, a Brazilian company, the biggest electrician distributor in Latin America considering income and consumption. It serves 24 cities of the São Paulo Metropolitan region – including the capital – which together have a population of 16.5 million inhabitants. Its concession area of 4,526 km² has 5.8 million customers units. AES Eletropaulo's environment activities are in accordance with AES Group global policy and are based in three commitments: the appropriated use of natural resources, pollution prevention and mitigation of the environment impacts connected to the company's activities on biodiversity. In this project, AES Eletropaulo is responsible for: (i) the power substation specifications, design and approval; (ii) the connection of the power substation to the power grid; and (iii) assuring the energy quality and availability for power substation operation until the delivery point.

BALLARD POWER SYSTEMS, a Canadian company, is recognized as the world leader in the design, development and manufacture of zero-emission PEM fuel cells. More than 140 vehicles powered with Ballard fuel cells are on roads around the world today. Ballard supplied automotive fuel cell stacks to the project, as well as gave its extensive knowledge and experience gained through five generations of fuel cell bus demonstration projects.

EPRI INTERNATIONAL, is the international arm of the Electric Power Research Institute (EPRI), a scientific research organization established in 1973 as an independent, nonprofit center for public interest energy and environmental research. With its major locations in Palo Alto, California, and Charlotte, North Carolina, EPRI brings together member organizations, the Institute's scientists and engineers, and other leading experts to work collaboratively on solutions to the challenges of electric power. These solutions span nearly every area of power generation, delivery, and use, including health, safety, and environment. EPRI's members represent over 90% of the electricity generated in the United States. EPRI International is the Project Manager and Leader of the Consortium, sharing lessons learned, coordinating acceptance tests and the evaluation of final products, and performing simulations to determine an optimum hybrid concept according to the EMTU's corridor drive cycle.

HYDROGENICS, a Canadian company, is recognized as a world leader in the development and production of electrolytic hydrogen fuelling systems. Hydrogenics supplied the electrolyser, compression, storage and dispenser equipment and technical expertise for the hydrogen station. Hydrogenics works together with Petrobras Distribuidora and Eletropaulo to enable site preparation, installation, commissioning and training for maintenance and safe operation of the hydrogen station.

MARCOPOLO, a Brazilian company, the biggest bus body builder in America, is the bus body supplier. Its established capabilities in Brazil will ensure the continuity with the current local vehicle fleet bus production and export.

NUCELLSYS, a company 100% owned by Daimler AG, located in Germany, is a world leader in the development, production and marketing of fuel cells systems for automobile application, and supplied the fuel cell systems, support to the bus integration, training, maintenance and service.

PETROBRAS DISTRIBUIDORA, Brazil's largest fuel distribution company with more than 7,000 service stations, is the prime integrator of the hydrogen fuelling station and also brought the experience of Petrobras' Research & Development Center (CENPES). Since forty years PETROBRAS is leader in byproduct distribution in Brazil, and one of the twenty major oil corporations in international ranking.

TUTTOTRASPORTI, a Brazilian company with long experience in chassis development, production, chassis modifications and alternative propulsion systems. Tutto is the complete vehicle integrator, the chassis manufacture and developed the vehicle control software, working together with world class suppliers, to design and build the fuel cell bus, including technical documentation, integration of the fuel cell and electric propulsion systems, tests and certification.