

DRIVE TRAINS

ESORO's roots lie in sustainable mobility. Since the company was founded, ESORO has been working intensively in the field of conception, implementation and tests of alternative and optimised vehicle concepts and drive systems. Electric-powered racing vehicles, various passenger cars suitable for everyday use with electric propulsion system, a very efficient IC-engine propelled vehicle, the TwinTrak hybrid system and the HyCar fuel cell vehicle have been designed and developed by ESORO. ESORO is thus one of the few companies in the world with well-founded experience in development and operation of electric, hybrid and fuel cell drives.

And all this is certainly not just an academic exercise. We have implemented all drive trains in concept vehicles and tested them in everyday use. Good design and perfect workmanship are also part of our commitment of our vision.



HYCAR – SWITZERLANDS FIRST FUEL CELL VEHICLE, 2002

Zero Emissions - Fuel Cell - Hydrogen

Terms which are currently hotly discussed in relation to sustainable mobility. During the course of a development project, ESORO dealt in-depth with specific implementation of various ideas. The result was the HyCar, a fully operable concept vehicle with fuel cell drive train and battery in a hybrid configuration. With its top speed of 120 km/h and range of approx. 360 km, the HyCar is more than a match for traffic - and is almost absolutely silent. The HyCar is fuelled with gaseous hydrogen and the only "waste gas" produced is water vapour. The HyCar is Switzerland's first fuel cell vehicle.

FUEL CELL SYSTEM



The fuel cell system located under the load floor in the rear of the HyCar. It is visible through a glass window and allows a look at this novel drive train technology.

POWER SOCKET



The front license plate hides a conventional 230V power socket. Therefore the HyCar becomes a mobile energy source for workmen or spare time activities.

HYSTATION



Using the demonstration hydrogen fuel station HyStation developed by ESORO- the HyCar is refueled as safe, as fast and as easy as a conventional car.

TANKS



Two 76l high pressure vessels made out of wrapped carbon fibres store gaseous hydrogen at 200 bar.

PACCAR – 5'385 KM WITH THE ENERGY OF ONLY ONE LITER OF FUEL, 2005

The possibilities of consequent optimization of energy consumption are demonstrated by PAC Car II of ETH Zurich: With energy of one liter gasoline, the fuel cell vehicle has a range of 5385 km! By this low consumption, the team of students sets a new world record during the Shell Eco Marathon in Ladoux (F) on June 26th, 2005.

ESORO supported the students in design and engineering of the vehicle and manufactured the light-weight body of the vehicle in carbon reinforced material. The monocoque weighs only 10 kg.



ESORO H301 – THE FIRST "HYPERCAR", 1994

The H301 family is the hybrid limousine version of the E301. The TWIN TRAK hybrid system of parallel configuration, developed and patented by ESORO, serves as the drive. In urban areas, the vehicle is operated purely electrically and, as of approx. 50 km/h, the internal-combustion engine cuts in. The interior comfortably accommodates four persons - even large persons - and the hybrid drive means that even long trips are no longer a problem. The H301 was referred to as the first Hypercar in the "Factor 4" book by Weizäcker/Lovins owing to its low consumption amounting to just a little more than 2 litres/100 km.

After about 70'000 km real-life operation, the H301 was equipped with state-of-the-art Lilon batteries in late 2007.



ESORO E301 – A DECADE AHEAD IN DESIGN, CONCEPT AND TECHNOLOGY, 1993

The E301 was designed by ESORO in early 1991 and presented at the 1993 Geneva Motor Show. With its well-balanced overall concept, a wealth of technical innovations and a convincing design, it caused a sensation and set a new standard for efficient lightweight electric-driven cars but also for compact vehicles in general.

Its drag coefficient of 0.195 is, even today, an absolute record value for a four-seater vehicle and its consumption of 9 kWh/100 km from the mains means that the E301 is still the record holder in its category.

Safety, efficiency and comfort were combined for the first time with lightweight construction, a modular bodyshell concept and an open system for three different drive concepts – electric, hybrid and small IC-engine.



ESORO E2 – THE WORLD CHAMPION, 1998

The E2 is ESORO's first electric vehicle and, with its consumption from the mains of 5.5 kWh/100 km, is still the world's most efficient two-seater car. It is able to fully cover its energy demand for 10,000 km/year with only 4.5 sq. m of stationary photovoltaic solar cells. The E2 won the following races and competitive events: World champion (Tour de Sol) 1988 / 1989 / 1990 / 1991, European champion 1990 / 1991, Best lightweight electric-driven car in 1989 (suitable for everyday use), Winner in the Austro Solar 1989, Winner in the Grand Prix E 1990. With its drag coefficient of 0.165, the vehicle has the world's lowest aerodynamic drag for a two-seater and is also the first lightweight electric-driven car with ASR/ABS.

