

Switzerland in Progress

Swiss Electric Vehicle Review

November 2003

Policy



Research&Development

HTI BIEL-BIENNE

Components

BRUSA

ESORO AG

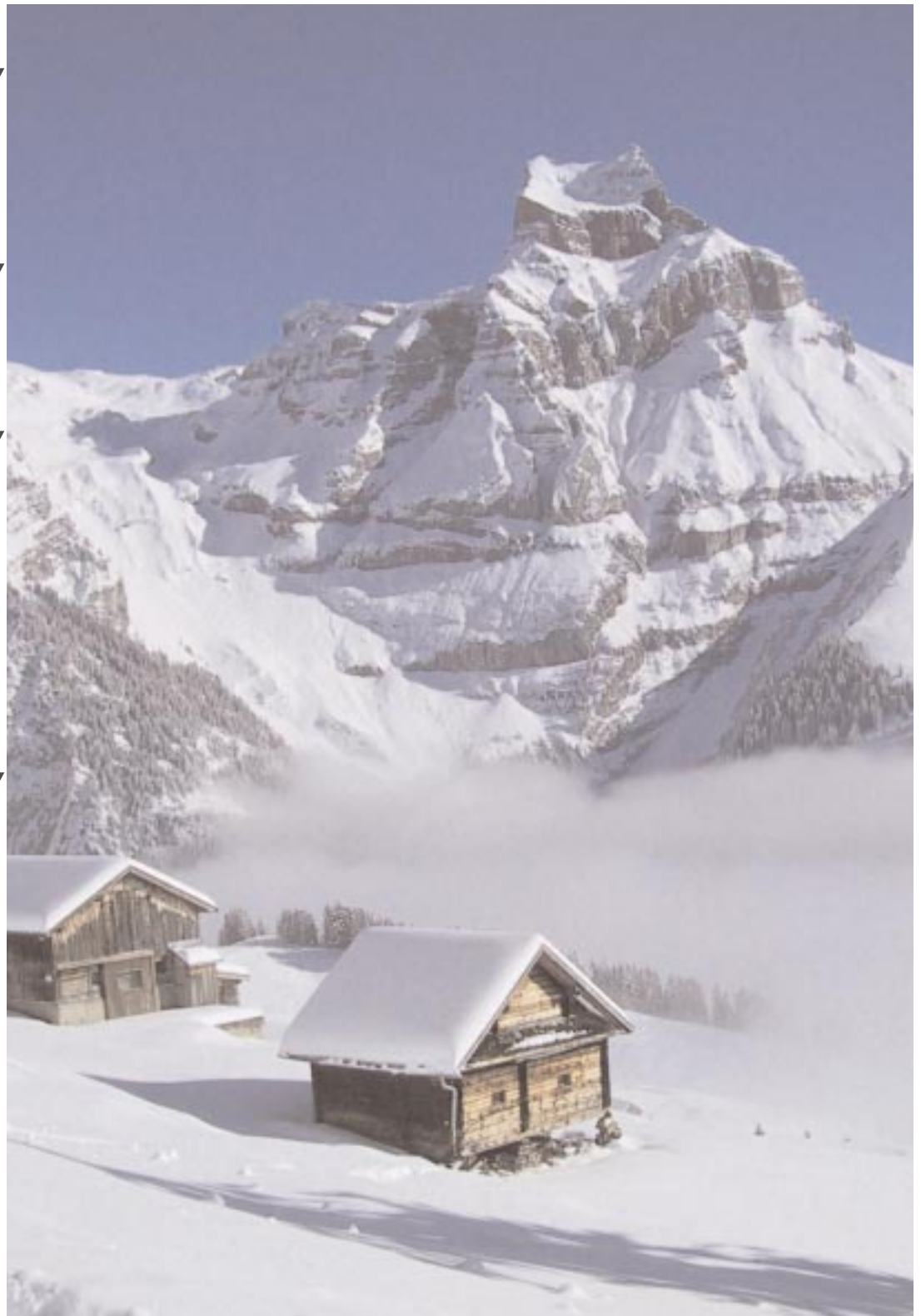
MES-DEA

Park&Charge

Promotion

e'mobile

NewRide



Switzerland in Progress

With a worldwide fleet of an estimated 800 million vehicles, 100'000 of which are electric or hybrid, the potential for progression of cars with electric power trains is still high. Other alternatives are equally being researched in order to make the current mobility more sustainable.

Great efforts are made in various countries to promote clean vehicles. Governments are increasingly conscious of the following facts:

- Many specialists consider hydrogen as the source of energy of the future, particularly in the field of transportation.
- Since hydrogen is an intermediate source of energy, the development of adapted technologies, at reasonable cost, will still take many years and the repercussions for the car industry are not anticipated before 2010.
- In a short-term prospect, significant results in terms of reduced fuel consumption and emission of pollutants can be expected from the development of new internal combustion engines, from the choice of alternative fuels such as natural gas or the bio-fuels and from the hybridization of drive systems.
- The use of new composite materials as well as highly developed power electronic also contribute to making vehicles more environmental friendly.
- New technologies will be successful in the market only if they fulfill the purchaser's wishes in terms of price, performance, comfort, safety, reliability and visual appearance.

Switzerland is particularly well placed in the field of components for the car industry because of the creativity of its companies. New solutions are offered each year, whether in the field of materials, production and storage of energy, power electronics or auxiliary equipment. These solutions are also tested with partners within the framework of large-scale tests. Thanks to its neutral character in respect to car manufacturers Switzerland offers a ground of predilection.

Research is also carried out by our universities and technical institutes to bring about solutions to the individual transport of tomorrow. The integration of various energies (fossil, hydrogen, electric), various motorizations (mechanic and electric drive trains), of different energy storage systems and electronic components call upon upscale knowledge and specialized teams. This is the ground of excellence for the Swiss contribution to the world of transportation of tomorrow.

René Bautz, President of e'mobile



René Bautz (president of e'mobile, left) and the President of Switzerland, Pascal Couchepin (right), at the EcoCar stand at the Geneva Motor Show in 2003.

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Impressum

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Electric Vehicles in Switzerland in 2003

In 2003 an estimated 1000 electric cars, up to 500 hybrid cars and as many electric scooters, more than 800 three-wheelers and close to 5000 electric bikes were circulating on Swiss roads. Of these close to 1000 electric and hybrid vehicles were registered in Canton Ticino, which is promoting efficient vehicles through its VEL2 project, a follow-up project of VEL1, the large-scale fleet test in Mendrisio. In this Italian-speaking Canton residents may get subsidies if they buy an electric vehicle, a hybrid car or an efficient petrol or diesel car emitting less than 120 g CO₂/km and complying with Euro4 standards for exhaust fumes. By October 2003 more than 1500 of these efficient vehicles were registered in Canton Ticino (p. 11).

Mobility Behavior of EV Drivers

Contrary to other countries, in Switzerland most EVs are owned and driven by individuals. The mobility behavior of private drivers of electric two-, three- and four-wheelers was investigated in the framework of E-TOUR (Electric Two-Wheelers on Urban Roads), a project within the 5th Framework Program of the EU, and of the large-scale fleet test in Mendrisio (1995-2001). The results have been published in 2003 (p. 10).

These findings show that in Switzerland EVs account for a substantial part of daily mobility of their owners and are mainly used for commuting. This investigation further indicates that the promotion of EVs is justified for several reasons. For instance EVs have a lower impact on the environment, two-wheelers have positive effects on land resources and – electric bikes in particular – on health.



In 2003 the Swiss Company Biketec launched its Flyer C5 with a Li-Ion-battery.



The new Prius at VEL EXPO TICINO, the largest exhibition of clean vehicles in Switzerland.



At the 2003 Geneva International Motor Show the EcoCar stand exhibiting alternative fuel vehicles was amidst stands of renowned car manufacturers.

New Legislation for Electric Bikes

With more than 1000 vehicles sold in 2003 electric bikes have been the most popular EVs in Switzerland in recent years. This is partly due to the programme NewRide, which successfully promotes electric two-wheelers in 21 towns (p. 10), as well as to new legislation put into force in spring 2003. This legislation has introduced the new sub-category of «light-mopeds» with similar regulations for admission as for conventional bicycles. Above all a driver's license is no longer needed for electric bikes with a motor of up to 250 W and assisting pedalling to a top speed of 25 km/h.

The fact that drivers of «light-mopeds» no longer need a driver's license has resulted in a marked growth of sales, with the Swiss-made Flyer C-series currently being the unchallenged market leader.

EcoCar Stand at the Geneva Motor Show

The market for electric and hybrid cars has been stagnating for the last few years, which was partly due to a limited offer of vehicles. One of the highlights of 2003 was the EcoCar stand at the Geneva International Motor Show with well over 700'000 visitors. At this collective stand managed by the Swiss association *e'mobile* three electric and hybrid vehicles as well as three natural gas vehicles were presented in one of the main exhibition halls (p. 9). This clearly indicates a continued commitment by the industry to develop a market for zero and low emission vehicles.

Promoting the Efficient Use of Energy in Switzerland

In ratifying the Kyoto agreement Switzerland has committed itself to a ten percent reduction of fossil fuel consumption from the 1990 level by the year 2010. The Swiss Federal Office of Energy (SFOE), the Federal Office for the Environment, Forests and Landscape and the Federal Office for Regional Planning share responsibility for efforts to reduce fossil fuel consumption.

The potential for reduction is particularly great in the field of transport, which accounts for roughly a third of the total demand, almost exclusively consisting of fossil fuels. Mobility is therefore a key sector.

SwissEnergy Programme

The SFOE is responsible for SwissEnergy, a government programme that promotes renewable forms of energy and efficient energy use. This programme involves the cantons, numerous municipalities, the energy industry, environmental and consumer organisations.

In the area of road transport, measures aimed at achieving the required reduction include regulations and, in particular, a goods declaration that has become compulsory for new cars on 1st of January 2003. An agreement with the Swiss association for car importers to reduce fuel consumption of new cars to an average of 6.4 liters per 100 km by 2008 and criteria concerning energy consumption of motor vehicles together with a variety of incentives are other important measures.

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PAC-Car – Fuel Cell Technology Powers an Ultra Efficient Car

PAC-Car is a fuel cell powered prototype with a power train developed by the Swiss Federal Institute of Technology in Zurich (ETH) and a body manufactured by the French University of Valenciennes. Its fuel cell has been developed by the Swiss Paul Scherrer Institute in Villigen along with ETH. The Proton Exchange Membrane consists of a 20-cell stack and delivers up to 900 W of power.



At the Shell Eco-Marathon in May 2003 in Nogaro, France, PAC-Car completed the 25.452 km with a hydrogen consumption of only 15.9 g/100 km, which is energetically equivalent to over 1'700 km/liter of gasoline.



With the aid of training, information, incentives and goods declaration SwissEnergy should bring about a shift from private vehicles to public transport and car sharing systems such as Mobility. The programme also promotes the use of bicycles and the purchase of energy-efficient

vehicles. By supporting the Eco-Drive project it encourages more efficient driving. The *e'mobile* association (p. 9) is doing its share to promote the most energy-efficient vehicles including electric, hybrid and CNG vehicles with its EcoCar project.

Encouraging Technical Development

The SFOE also provides support for research and for «pilot and demonstration» projects aimed at reducing energy consumption.

One area of focus is electric and hybrid vehicles. Developing new vehicles is ranging from a hybrid bus running on natural gas and electricity stored in super-capacitors to a low-cost electric motor bike and a kick-board with super-capacitors. The SFOE also supports developments in the areas of infrastructure such as Park & Charge (p. 7).

Other areas of interest concern components such as chargers by Brusa (p. 6) and the Baladum-project by the Biel School of Engineering and Informatics (p. 5) as well as the ZEBRA battery by MES-DEA (p. 7). Several projects involve fuel cells like the PAC-Car projects and the use of super-capacitors.

Promoting a Rational Use of Energy

The most important transport-related project was the six-year large-scale fleet test of lightweight electric vehicles in Mendrisio in the southern part of the Italian-speaking Swiss Canton of Ticino. In 2001 it

was succeeded by VEL2 (p. 11). This project is to run until 2005 and promotes all kinds of energy-efficient vehicles throughout the canton. VEL2 is seen as a vital step towards a sustainable mobility lifestyle.

Like the Federal Government, many Swiss cantons and communes also promote energy-efficient vehicles as part of their own projects. The most important of these is NewRide that promotes electric two-wheelers (p. 10). In 2003, 21 towns have been participating in this nation-wide programme.

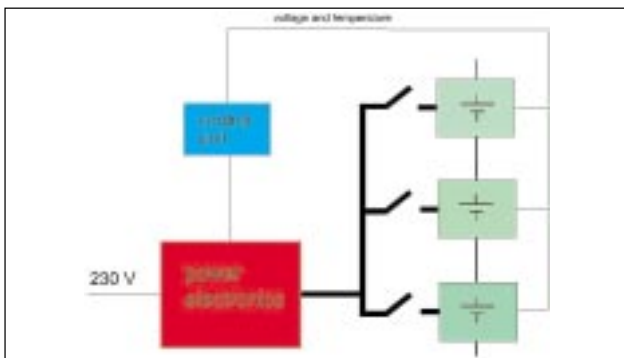
Research & Development

BALADUM – a new Battery Charger

BALADUM is a charger switching automatically, which makes it possible to charge lead batteries in series connection in strings of 12V battery blocks.

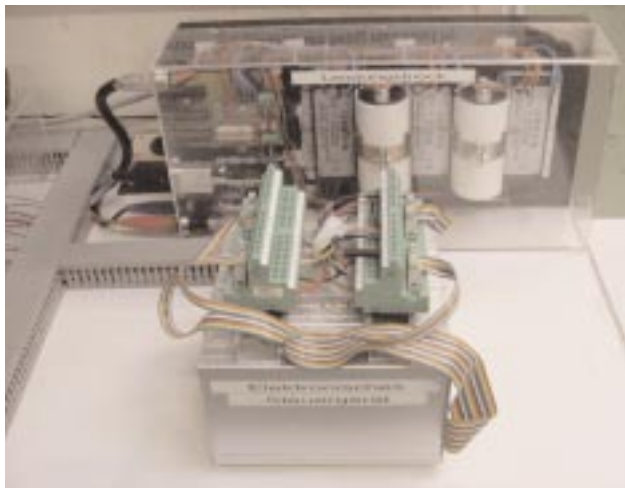
It has been known for some time that the cycle life of lead-acid batteries can be improved if one uses high charge currents. The beneficial effect of high charge current during cycling was confirmed in our own tests using our automated test equipment. A higher number of cycles could be achieved when charging at high currents – for instance at 0.5 C or above – as compared to charging at 0.1 C.

Unfortunately, the use of high-rate on-board chargers generally increases the cost for electric vehicles. The Biel School of Engineering and Informatics developed a charging technique, which allows the use of high charging rates without undue increase of costs for the charging unit.



As illustrated in the figure above, we developed a charging technique, which allows charging a string of series-connected 12 V battery blocks. Each 12V block is being charged individually at a high rate (typically 0.5 C or above) for a short period of time (typically 0.5 to 5 minutes) in sequence, using relays and a control unit. After a (small)

The hardware of the BALADUM charger



Engineering College for Automobile Technology in Biel

The Biel School of Engineering and Informatics is part of the University of Applied Sciences of Canton Berne and of the Swiss vocational education system. The diploma the students get when they graduate from the Biel School of Engineering and Informatics is roughly equivalent to a Bachelor of Science degree. There is no curriculum for a master's degree, for doctorate or for post-doctorate studies.

The Automobile Technology Department is the only engineering college for automobile technology in Switzerland.

partial charge the current is switched automatically to the following battery block. When the last battery block has received its partial charge, the sequence is repeated, which means that the first battery



Electric test vehicle of the HTI Biel-Bienne

block is charged again. This procedure is continued until all battery blocks are fully charged. In case the charging process is stopped prematurely, each battery block has reached approximately the same level of charge due to the short duration of the partial charges.

During the charging process the voltage and the temperature of the batteries are measured by the control unit. This permits to terminate the charge properly without the risk of overcharging.

A patent is pending for this new charging method.

HTI Biel-Bienne

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Power Electronics for Future Mobility

BRUSA Elektronik AG supplies leading manufacturers and researchers, mainly of the automotive industry, with highly specialized power electronics.



Our mission is to power up clean transport systems of the future by developing and manufacturing components for

- Fuel cell applications
- Battery powered vehicles
- Hybrid electric drive trains

Core Competencies

- Systems Engineering: We develop complete electric drive train systems.
- Cutting edge technology: All our high-power electronics rely on powerful microprocessors and soft switching topology to achieve highest efficiency at lowest electromagnetic interference.
- 18 years experience in the field of automotive power electronics, that means an extraordinary level of expertise to provide you with the best solutions for your specific development goals.
- Flexible small to medium scale in-house production. Due to cooperation with reputable industrial partners and spare room for expansion in our new facility, we are well prepared for future challenges.
- A wide range of accessories such as amp hour counters, aux voltage converters etc. for complete solutions.

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BRUSA

Core Products

The following leading edge products impressively demonstrate the perfect match of high electric power and sensitive control. They represent the main application area of our technology. However, custom versions and completely different applications are available as well.

High-tech battery chargers of unmatched flexibility:



- easily programmable for any charging profile via simple PC software
- output voltage range 100 – 720V
- 3.3 / 6.7 / 10kW models available
- efficiency up to 93%, low EMI
- compact and lightweight (6 kg)
- control via CAN available

Bidirectional high-power DC/DC converters for fuel cell applications:




- 450V, 150A, continuous power up to 20 kW
- efficiency up to 98%, low EMI
- ultra compact (easily fits in a briefcase) and lightweight (10 kg)
- CAN controlled

AC electric drive systems up to 100kW:



- optimized electric motors for standard, high torque (300Nm) and high speed (100'000 rpm) applications
- inverters that are specifically adapted to the motors for optimum performance
- CAN controlled
- induction, PM synchronous and reluctance types

Components




MES-DEA
offers
components
for electric
and hybrid
vehicles

MES-DEA
Via Lavaggio, 15
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Switzerland



Components for Electric Vehicles



- ZEBRA battery with accessories
- Fuel cells for different applications (PEM Technology)
- Chargers for all battery types
- Drives (motors and inverters)
- Electric heaters
- Long life water circulation pumps
- Thermostats

For more information please contact us:
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LEMnet: Directory for Recharging Possibilities



Finding a socket to charge an electric vehicle is usually no problem in Switzerland. There are close to 1000 restaurants, hotels, shopping centers and various other places listed in a directory called LEMnet, where EV-drivers are welcome to recharge the batteries of their vehicles. This directory includes natural gas filling stations in Switzerland and gives details on tourist attractions nearby. It is accessible on www.twikeklub.ch/LEMnet.

Park&Charge: Standardized System of Low Cost Public Charging Stations

LEMnet includes over 200 public charging stations of the low cost system of Park&Charge. These offer charging facilities and parking lots reserved for EVs. One single key gives drivers access to all the boxes or pylons with sockets allowing three vehicles to charge at the same time. Some of the stations offer accelerated charging at 7 kW/32 A. Charges for electricity are paid either by a yearly flat rate or by a day ticket. To use the reserved and marked parking lots electric vehicles require a special EV sticker.

These public charging stations considerably facilitate traveling longer distances and help to increase the range of EVs. In Switzerland the network is gradually extended. Furthermore, Park&Charge has also been introduced in Germany, Austria, Lichtenstein, Italy and France.



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Components



Technology for Environmental Friendly Mobility

ESORO is an independent Swiss engineering company with a high innovation potential. Since its foundation in 1990, ESORO develops technology for environmental friendly mobility. Core competencies of ESORO are:

Product and Component Design

ESORO offers the entire engineering cycle (conception, CAD, FEM, prototyping, validation) from feasibility study to prototyping or pilot production.

E-LFT – A new Production Process for FRPs

ESORO develops production technologies for fibre reinforced plastics (FRP) to produce lightweight structures and components. ESORO has in-house a fully automated pilot plant and test facilities, which allow to engineer the process and the parts up to initial production. The novel E-LFT-process enables the production of structural parts in the range from 30'000 to 300'000 units per year.



Sustainable Drive Trains

Innovative drive trains, such as fuel cell systems, are developed and integrated. ESORO has more than 13 years of experience in developing sustainable drive trains.

Concept Vehicles

ESORO develops concept vehicles for exhibitions such as the Geneva Motor Show from scratch to the working prototype. HyCar is a working fuel cell concept car. It is powered by a fuel cell system and a battery in hybrid configuration. The fuel is hydrogen that is stored in two high pressure tanks behind the seats and allows for a range of 360 km. A 35 kW electric motor accelerates the car up to 120 km/h. HyCar has been developed and manufactured entirely by ESORO. Among other tasks the



project included the conception of the vehicle and the drive train, real-time simulation of the fuel cell system, virtual mock-up, hard- and software control, integration of the fuel cell stack, manufacturing and assembling of the vehicle as well as stationary and mobile testing. For more information, see www.hycar.ch.

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Events in 2004

Major Events in Switzerland 2004

74th Geneva International Motor Show

EcoCar stand showing a selection of electric, hybrid and natural gas vehicles

March 4 – 14, 2004, Geneva

For more information see www.e-mobile.ch

Voiture et cité de demain

Conference on new car technologies with a focus on alternative and advanced energy sources

March 31, 2004, Federal Institute of Technology in Lausanne

For more information see www.e-mobile.ch

Mendrisio Mobiliti

International conference for sustainable mobility

May 14, 2004, Mendrisio, Switzerland

For more information see www.vel2.ch

VEL EXPO TICINO

The biggest Swiss exhibition of environmental friendly vehicles
September 2004, Lugano

For more information see www.velexpo.ch



Promotion

Promoting Zero and Low Emission Vehicles



e'mobile is the Swiss Association for Electric and Efficient Vehicles. Its main activities focus on the promotion of electric vehicles and all other vehicles that use energy efficiently and have low emissions. The most important project of *e'mobile* is EcoCar. It aims at speeding up market introduction of zero and low emission vehicles. As a Swiss Energy project EcoCar is supported by the Swiss government. Other project partners are car manufacturers and importers as well as associations of the automobile and the energy industry. Due to this collaboration many distinguished experts are available for the EcoCar project. Consequently this provides a fertile ground for innovation in favor of sustainable development in the field of mobility.

Market introduction of electric and other efficient vehicles is supported by

- running regional information centers in the French, the German and the Italian speaking parts of Switzerland offering an unbiased advisory service;
- offering test drives of electric and hybrid vehicles as well as natural gas vehicles and conventional cars with low fuel consumption;
- participating in exhibitions such as the Geneva International Motor Show and other events;
- providing up-to-date information in three languages on the homepage www.e-mobile.ch;
- publishing the newsletter EcoCar News with background information on selected subjects;
- supporting members by its media service and by distributing press releases;
- offering advice by its network of experts in all fields concerning electric and hybrid vehicles.

The members of *e'mobile* represent the Swiss vehicle and components manufacturing industry, the international car industry, battery manufacturers, electricity suppliers, research institutes, public authorities and automobile associations including the Electromobile Club of Switzerland ECS, which represents EV drivers.

e'mobile is an affiliated member of the European association AVERE which is part of the World Electric Association WEVA.



At the Geneva International Motor Show in 2003 the EcoCar stand of *e'mobile* was part of the main exhibition and it presented a selection of electric, hybrid and natural gas vehicles.



e'mobile participated also at VEL EXPO TICINO 2003 in Lugano.

Organizing exhibitions with Ride&Drives are among the major activities of *e'mobile*.



Part of the glossar available in 4 languages on *e'mobile's* homepage www.e-mobile.ch

	Glossar			
	Deutsch	English	Français	Italiano
Presse • Pressebulletin • Pressekontakt • Kontaktbox	Alternative Fahrzeug	Zero-emission Vehicle	Véhicule sans gaz, à recharge	Veicolo a zero emissioni
Informationen • Wissensservice • Glossar • VEL 2 im Test • NewsBox	Alternative Antriebssysteme	Alternative propulsion systems	Systèmes de traction alternatifs	Sistemi di trazione alternativa
EcoCar • Projekt EcoCar • Marktübersicht • Ermap	Alternativer Treibstoff	Alternative fuel	Carburant alternatif	Carburante alternativo
	Batterie-Kapazität	Battery capacity	Capacité de batterie	Capacità della batteria
	Alternativer Treibstoff	Alternative fuel	Carburant alternatif	Carburante alternativo
	Batterie-Kapazität	Battery capacity	Capacité de batterie	Capacità della batteria
Verband • Infozentrum	Batterie-Ladezustand	State-of-charge of battery	Etat de charge de batterie	Stato di carica della batteria

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NewRide – Electric Two-Wheelers in Swiss Cities

Promotion by Improving Market Conditions

NewRide is a Swiss national programme to enhance the market introduction of electric bikes and electric scooters. The main activities are: strengthening the commitment of the manufacturers and importers, improving the competence of the local dealers (NewRide-dealers) and creating local networks which provide communication platforms as part of the market introduction. In 2003, 21 Swiss cities were participating. They coordinate promotional activities of the NewRide dealers at a local level and organise exhibitions with Ride&Drive either in the context of a traditional fair or as a separate event. The range of vehicles promoted by NewRide consists of 12 brands of electric bikes and scooters with a total of more than 30 different models. Subsidies are not a main issue of NewRide. Nevertheless, NewRide cities are free to support the promotion of the market introduction by financial incentives. In 2003, five cities provided subsidies of 10 to 20%, some of them only for a limited number of vehicles. The main information tool is the website www.newride.ch with information on subjects such as News, Description of the programme, NewRide cities, Vehicle catalogue, NewRide dealers, NewRide companies, FAQs and Events.



Miss Switzerland Nadine Vinzenz (right) and Councillor Barbara Egger of Canton Berne enjoyed riding electric bikes at a Ride&Drive in Berne. PHOTOPRESS/Alessandro della Valle

Highly Appreciated Programme

NewRide's approach of improving the conditions for the market introduction of electric two-wheelers according to the means and skills of the partners seems to be promising. The programme is highly appreciated by local authorities as well as the media and the general public. However, the final break-through of electric two-wheelers in

terms of sales has not yet been achieved.

With only 7'000'000 residents Switzerland seems to be too small for a large market introduction of electric two-wheelers. In order to reach a sufficient market penetration justifying an industrial production, an internationally coordinated promotion is needed.

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Mobility Patterns and Electric Vehicles

The mobility pattern of drivers of electric two-, three- and four-wheelers was investigated in the framework of E-TOUR (Electric Two-Wheelers on Urban Roads), a project within the 5th Framework Program of the EU, and of the large-scale fleet test in Mendrisio 1995-2001 (see the CD-ROM «VEL-Mendrisio 1995-2001»).

The aim of the research was to pinpoint the impact of the different types of lightweight electric vehicles (LEVs) on the mobility pattern of households and individuals. The investigation focused specifically on two parameters:

- On a survey of kilometers traveled that provided information on changes in mileage for all vehicles in a household, and
- On a mobility logbook that allowed statements on the number of trips, their length and duration as well as the purpose and the means of transport chosen by the person who most frequently used the LEV.

The investigation showed that EVs covered a substantial part of daily mobility and were mainly used for commuting. People bought the EV to handle their mobility more environmental friendly in comparison to the use of a car and to be more flexible and faster as compared to public transport and bikes.

Ecologists have argued that EVs might stimulate additional traffic. The results at the level of households do not confirm these concerns. In contrast, the mileage of households without reported changes of external conditions slightly declined.

Electric three- and four-wheelers replaced mainly car trips, whereas two-wheelers substituted trips of all means of transport. Regarding energy consumption the use of two-wheelers reduced the overall fuel consumption of a household and the tailpipe emis-



The town of Basel promotes electric two-wheelers.

sions by about 5%. The effects of the three- and four-wheelers were more significant: In the Italian speaking households tailpipe emissions could be reduced by 30% and fuel consumption by 20%.

For more details ask for the final report at uschwegler@e-mobile.ch.

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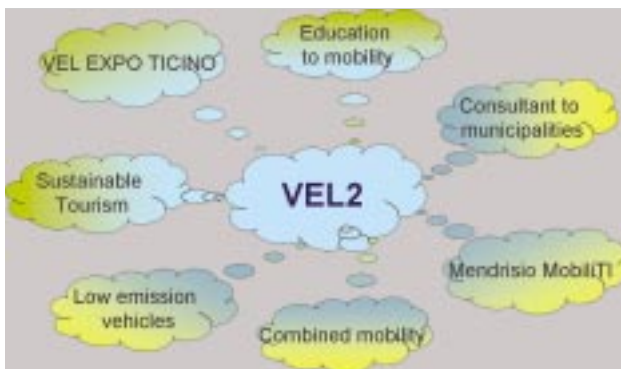
VEL2 Project – A Bunch of Sustainable Mobility Activities

VEL2 is a promotional project for sustainable mobility and low emission vehicles in Canton Ticino, the Italian-speaking region of Switzerland. It started in July 2001 as a follow-up of the successful pilot project for the introduction of lightweight electric vehicles in the area of Mendrisio, and it is planned to end in 2005. Its main goal is the introduction of sustainable mobility on the cantonal territory through various activities and the promotion of efficient vehicles including e-bikes, e-scooters and low emission cars that comply with the EURO4 standard and that have CO₂ emissions lower than 120 g/km.

The activities promoted and supported by VEL2 cover many areas. The most important ones are the following:

- VEL2 is an appreciated consultant for municipalities of the Canton that would like to improve the life of their citizens by implementing sustainable mobility measures. For example, the Municipality of Lugano – the Canton's largest town – has introduced parking facilities for efficient vehicles in the city center. The Municipality of Minusio has launched a project for the promotion of e-bikes on its territory. Several other municipalities have bought an electric vehicle for their fleet.
- Ticino is a region highly appreciated by tourists particularly because of its mild climate and its landscape of beautiful lakes and mountains. To limit the corresponding on-site traffic VEL2 and the Lago Maggiore Tourist Office have set up an e-bike rental service providing specific itineraries that allow discovering the territory without polluting it. Some hotels and camping grounds collaborate in this project. Other hotel owners have acquired an efficient vehicle themselves for their own use or to offer it to their hotel guests as a complimentary vehicle.
- Education to sustainable mobility needs to be taught at best already at a young age in order to be successful. For this reason VEL2 offers theoretical and practical lessons on sustainable mobility to 9th grade school classes. Starting in fall 2003 this project is supported by the Department of Education of the Canton and, hence, it will be officially introduced into the school program.

VEL2 – A sustainable mobility platform



Exhibitions and free test drives help promoting low and zero emission vehicles

- The VEL2 Project participates in various events in Canton Ticino. This allows being visible and getting in touch with people easily, especially by offering free test drives of the promoted vehicles. The main event organized by the VEL2 Project itself is VEL EXPO TICINO, the largest exhibition of environmental friendly vehicles in Switzerland that takes place every September in Lugano.



Marco Borradori, State Councillor of Canton Ticino, at the opening of VEL EXPO TICINO 2003

- The other big event organized by VEL2 is Mendrisio MobiliTI, a conference for sustainable mobility with renowned international speakers. In 2003 the conference's focus was on successful projects in various European cities. The topic has been introduced by representatives of the Italian Institute for Sustainable Development, the World Business Council for Sustainable Development, the World Economic Forum and the Architecture Academy of Mendrisio, who presented the point of view of their organizations.

The VEL2 Project with its numerous activities can be seen as a necessary bridge towards a sustainable mobility lifestyle. Switzerland and even the entire world can greatly benefit from the VEL2 experience and results. In a few years time the choice of new generation vehicles could be supported for example by new laws such as tax scales based on CO₂ emissions. For more information please visit our website: www.vel2.ch.

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MAGGIORE!
eBike



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e-bike rental

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