

AVERE
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EVS-21 report **Monaco, 2nd to 6th April 2005**

General

The 21st Battery, Hybrid and Fuel cell Electric Vehicle Symposium and Exposition, EVS-21 for short, has taken place from Saturday 2nd to Wednesday 6th April 2005, hosted by AVERE, the European Association for Battery, Hybrid and Fuel Cell Electric Vehicles and AMAVE, its local national section, in the prestigious Grimaldi Forum of Monaco.



EVS-21 has drawn a total of 1 618 participants including 822 delegates, 43 accompanying persons, 617 exhibitors, 30 special guests and 106 accredited journalists. In addition over 9 000 visitors from the general public came to see the exhibition.

As regards the geographic breakdown of the delegates 64.5% were coming from Europe and Africa, 21% from Asia and the remaining 14.5% from the Americas.

109 exhibitors from all around the globe presented their products on over 4300 m². A detailed splitting shows 40 vehicle or component constructors, 14 battery or fuel cell manufacturers, 6 energy suppliers and 17 institutions. The remaining 32 were mainly universities or research laboratories.



Also not to forget the impressive Ride & Drive gathering 49 four-wheel vehicles and 30 two-wheel vehicles. 2 electric boats were also to be tested in the Monaco's harbor.



As regards the press, over 106 accredited international journalists reported on the event, including television and radio crews. They were particularly attracted by the opportunities to test drive electric vehicles which offered to the visitors and participants an unique opportunity to experience the performance of the vehicles of the future in city traffic and on closed circuits near to the exhibition halls.



Rally and Parade

EVS 21 has started by a parade of plug-in battery electric vehicles that left, on the Saturday, Menton to Monaco, and which was organized by the Mediterranean Association of Electric Vehicles. It included scooters and battery operated vehicles provided by EVS 21 exhibitors.

The following day, a Rally joining Lugano in Switzerland to Monaco and organized by the Automobile Club of Monaco under the aegis of the FIA arrived in Monaco. It covered a distance of approximately 410 Km through Switzerland, Italy and France before arriving in Monaco.

The hybrid vehicles did not had a refueling stop, but one was provided for the fuel cell vehicles. The journey time was about six hours. Fuel consumption was measured and the results have provided a classification for the different categories of vehicle. Five major car companies participated in this event, GM, Fiat, Toyota, Daimler Chrysler and Hyundai. The rally was very well covered by the media as intending to show to the general public that clean vehicles are now a reality.



Podiums were, for fuel cell cars;

- 1- Frentzen/Trost - GM – Zafira;
- 2- Lee/Choi - Hyunday – Tuscon;
- 3- Daimler-Chrysler – Class A.

For hybrids, the winner were:

- 1- Mazzoni/Liverani - Team Selene - Tanesini/Selene;
- 2- Schmal/Mourad - TNO Automotive - VW New Beetle;
- 3- Lisi/Lisi - privé - Toyota Prius.

Detailed results are available upon request at AVERE Secretariat.

Participants in the two rallies then joined for an impressive parade through the streets of Monaco.



Exhibition

On Saturday, the exhibition was open to the general public.

With 109 stands including major international names such as Volkswagen AG, eVionyx, EDF, "Dassault - Heuliez" Société de Véhicules Electriques, Gruau, Matra Automobile Engineering, Exide, Valeo, Yamaha Motor Europe, Ballard Power System, General Motors Corporation, Honda Motor Coporation, Citroën, Peugeot, Nissan Motor Co., Japan Automobile Research Institute, Toyota Motor Corporation, Saft, Hyundai Motor Company, Vectrix Corporation, Venturi Automobile, Varta Automative Systems, Johnson Controls, Linde AG, Nippon Chemi-con Corporation, Cobasys, Maxwell Technologies, Segway LLC, DaimlerChrysler AG, Lombardini, Valence Technology Inc, Hydrogenics Corporation, Axane but also a whole range of specialist medium and small-sized companies, the exhibition was, there is no doubt about it, a success.

When entering the exhibition hall, the visitors were welcome by the world famous electrically propelled "Jamais contente", the first car that ever reached 100 Km/h when, on 1st May 1899 its Belgian driver, Camille Jenatzy, reached its top speed of 105,882 Km/h in Achères located in France.



After this historical reminder, the visitors could enjoy an impressive demonstration of the rapid development in the sector from back-street workshops to prototypes for series production.

As far as personal cars are concerned, it has to be mentioned that VOLKSWAGEN presented a new diesel hybrid concept that will be available for next year, presently tested in the GOLF, to be used in the BEETLE and JETTA for a 25% better fuel economy. The company also presented a concept car that is devoted to test different types of hybridizations.



GENERAL MOTORS presented its famous HYDROGEN 3 that crossed all Europe, from extreme North to South last Year.



HONDA displayed its hybrid CIVIC IMA vehicle and had a good explanatory article on hybrids. They also had a hybrid scooter for sale and an electric moped.

HUYNDAI presented its TUCSON fuel cell SUV while LEXUS ANNOUNCED THAT RX 400h SUV hybrid will be available in Europe as from this month at around EURO 60 000. The fuel efficiency of approx. 8,5 l/100km and a 0 to 100 km/h acceleration in less than eight seconds. It is equipped with a 500-volt power system to drive a front electric motor, and a second electric motor for rear wheels



TOYOTA presented a new concept of fuel cell hybrid car based on a SUV model and the PRIUS were obviously also to be seen.



Most interesting are the researches that are made on the basis of the conventional TOYOTA PRIUS model. In particular, VALENCE TECHNOLOGY Inc., a leader in the development of large-format Lithium-ion rechargeable batteries, and ENERGYCS, developers of integration control systems, showcased a new concept plug-in hybrid electric vehicle.



Another variation based on the Prius is the prototype developed by CFBP and IFP in replacing the thermal motor of the Prius by one propelled by LPG, so enabling to reach a CO₂ emission level of 92g/Km.



One other star of the exhibition was the "CLEANOVA" an electric car based on a RENAULT KANGOO platform that the French postal group will experiment starting next summer and that has been developed by SVE, the Société de Véhicules Electriques. SVE is a joint-venture created between DASSAULT and HEULIEZ to develop of a new generation of electric vehicles. DASSAULT provides its know-how in electronics like vehicle command systems and on-board energy optimization and HEULIEZ its experience in the manufacturing of complete electric vehicles.



DAIMLERCRYSLER presented obviously the last research for fuel cell and that are based on the A CLASS as well as a hybrid SPRINTER van.



The PIAGGIO Porter was available at EURO 20 000.



Just to remind us that we were in Monaco, a VENTURI FETISH, an electric racecar that goes 0-100 Km/h in 4 seconds was on purchase for EURO 450 000...



Finally, it has to be noted that the PSA Peugeot Citroën Group is continuing the promotion of the PEUGEOT PARTNER Electric that is commercialized since 1998 and allows autonomy of 100 km as well as a maximum speed of 95 Km/h.



The Group also displayed its youngest concept-car, the QUARK that is a feast of innovation and falls into the technological demonstrator category. This machine highlights and extends the advances unveiled through the Taxi PAC and H2O in the area of fuel cell development.

Seeming to have escaped from a world of science fiction, powered by four electric motors installed in each of its four wheels, it illustrates the level of performance offered today by the fuel cell, the range of which has been extended to 130 Km. Furthermore, this third-generation demonstrator is exploring a new direction that is leading to the miniaturization and simplification of fuel cell technology.



Not to be forgotten, the CITROEN C3 STOP & START was also exhibited. This soft hybrid, automatically stopping the engine when the vehicle is at still stand, is available as from EURO 15 300 and allows to reach CO₂ emission level of 135 g/Km.



Proximity cars were in important number in Monaco, so showing the dynamism of this sector due to forecasted business opportunities in the field.

In particular, the SMART car, produced by DAIMLERCHRYSLER, will be available next year in electric using a ZEBRA battery but, unfortunately, at a costs close to EURO 30 000 as compared to about EURO 15 000 for the traditional version. The electric, using ZEBRA batteries NaNiCl is sold under the ZYTEK name. DAIMLERCHRYSLER had also its GEM golf car now available in Europe at a price lower than EURO 7000.



The India REVA car is now available at the Price of EURO 7 000 in England were about 1 000 vehicles have already been sold, the car also becoming a fashion symbol.



There was a cute electric car called the MARANELLO, with a range of 75 Km with 8 gel cell batteries.



The remodeled KEWET rode nicely and the batteries are easy to replace. This is an affordable vehicle at about EURO 10 000 that should be available in the next year.



The GREEN CAR COMPANY had some cool mini cars and trucks, the BINGO, DOMINO and HOLA operating at 48V with 8 x 6V golf cart batteries. The BISCOT, a nice proximity car that that is available at EURO 9 995 was also to be seen.



Thanks to the presence of the GRUAU and IRISBUS companies, battery, hybrid and fuel cell busses assured shuttle between the Grimaldi Forum and the harbor of Monaco. As far as public transport is concerned, the FROG concept attracted a lot of attention.



As far as two-wheelers are concerned, some innovations have to be pointed out. Originally aimed at security forces, the TIDALFORCE M-750 is a rugged, durable and foldable electric mountain bike. In the back hub is its patented WAVECREST Adaptive Motor system, and in the front hub are the SAFT Ni-MH batteries. The bike has a range of about 32 Km on a single battery charge.



VECTRIX had a new electric motorcycle for EURO 8000 that goes up to 110 km per charge and up to 100km/hr on NiMH batteries.



INTELLIGENT ENERGY had a sport motorcycle with a range of 160 Km, 6kw, 48V with a 90 Km/h top speed.



In addition to the traditional Ni-Cd batteries SAFT displayed a new Lithium-Ion battery, the VLE 22-42 at 21.6V at 42ah, which weighs 8 kg.

ELECTROVAYA had some good Lithium ion super polymer batteries with a claimed range of over 350 Kms. According to the manufacturer, the batteries are ready to be installed in vehicles and are a prime contractor with NASA and MICROSOFT for laptops...

MAXWELL CAPACITORS had its usual offerings but at a reduced cost as this technology matures. The company also had balancers, which keep individual caps in a series string from over-volting. They are useful for batteries and fuel cells to take away current peaks, thus making batteries last longer.

But the show was not only on the road, boats were also to be seen in the harbor of Monaco and the AQUABUS C60, a catamaran produced by the Swiss company MW LINE, attracted a lot of attention. The

boat is equipped by two electric motors as well as with solar panels. According to the manufacturer, the exploitations costs are 45 times lowers than for a similar boat equipped with thermal engines.

A smaller boat on display was the HYDROXY3000, the last generation of family leisure FC Boats produced by IESE, an engineer school in Switzerland, using a 3 kW PEM fuel cell. With an efficiency of about 33%, absence of pollution and reduced noise, this solution seems very interesting for small pleasure boats.



Symposium

As from the beginning, EVS-21 has attracted great interest as the ever high number of abstracts received has been reached when 382 papers were submitted mid 2004.

After careful examination by the International Program Committee 137 were selected for lecture presentation and 151 for dialogue. 51% came from Europe, 17% from the Americas and the remaining 32% from Asia and Pacific. To be noted that, for the first time, the lecture session were running on five parallel tracks.

The symposium was formally opened by welcome speeches by HE Bernard Fautrier, EVS-21 President, Pietro Menga, AVERE and World Electric Vehicle Association President, Brian Wynne, EDTA President and Professor Hisashi Ishitani, EVAAP President.

In particular it has to be noted that Pietro Menga said that the role of the media is important to promote sustainable mobility as they are the only one to really draw the attention of the general public to this curtail matter so pushing it at the first places of politician's and decision makers' priorities. Europe must reduce its 98% dependency on foreign oil and develop a clean political vision for sustainability he also said.

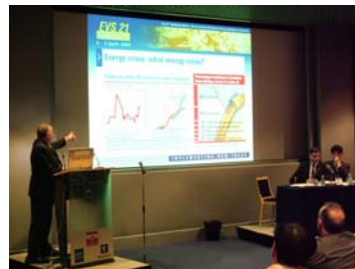
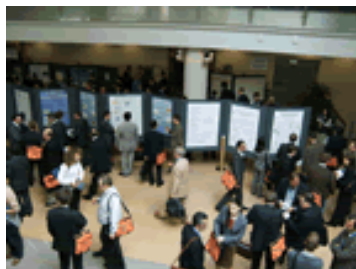


He then pointed out that Hydrogen may not be viable until 2020 to 2030 and that something must be done sooner. Battery vehicles are more near-term but the end user does not see the advantage yet. Battery vehicles and hybrids are ready to be implemented and plug-in hybrids especially result in increased fuel economy, noting that pure electrics are good for delivery of goods and services.

During the opening session, top industrial leaders like Masatami Takimoto, Senior Managing Director at Toyota Motor Corporation, Matthias Rabe, Head of Corporate Research at Volkswagen AG, Pierre Gadonneix, President of Electricité de France, Michel Herchin, President of the "Dassault - Heuliez" Société du Véhicule Electrique were in line with the political world represented by Walter Schmied, President of the Committee on the Environment, Agriculture and Local and Regional Affairs of the Council of Europe, HE Kapil Sibal, Indian Minister of Science and Technology and HE Serge Lepeltier, French Minister of Ecology and Sustainable Development, since they all shared the same view that it is now crucial to find, without any further delay, a solution for a clean mobility without having a negative impact on the economy or affecting the growth.

Following the Opening Session, the conference delegates were, during two and a half day, able to attend different sessions on topical issues surrounding battery, hybrid and fuel cell technologies. The following topics were examined:

- Auxiliary Systems;
- Batteries and Energy Storage;
- Energy Supply and Infrastructure;
- Energy Efficiency and Energy Security;
- Energy Supply and Infrastructure;
- Environmental Impacts;
- Environmental Impacts, Energy Efficiency and Energy Security;
- Fuel Cells;
- Fuel Cells and Auxiliary Systems;
- Introduction and Demonstration;
- Life-Cycle Analyses and Strategies;
- Marketing and Market Research;
- Modeling and Simulation;
- Non-Road, Industrial and Military Applications;
- Other Vehicles or Transport Systems;
- Passenger Cars;
- Propulsion Systems and Subsystems;
- Public Education and Promotion;
- Public Education, Promotion, Specific Fleet Applications and Management;
- Public Policies and Programmes;
- Public Transport and Heavy Duty Vehicles;
- Recreation and Light Vehicles;
- Specific Fleet Applications and Management;
- Standardization, Regulations, Training and Job Creation.



As important as the technological exchange of views, political discussions took place through various round tables held in parallel to the traditional session. It has become apparent that solutions linked to behavior and mobility regulation need to be found. This shows that technology by itself will not be enough to mitigate the negative impact of mobility but that we will have to utilize technology intelligently in order to develop new rational and integrated mobility systems.

The first, round table was organized to stimulate Minister and top decision makers to investigate *“How can we promote sustainable mobility in our towns?”*. The goal was to have direct exchange with high level politicians on ways to favor the development of less polluting public transport systems and the introduction of measures that financially penalize, and therefore discourage, personal auto use in city centers. Solutions associated with the implementation of new technologies were also thoroughly examined.

A second round table was provided to generate the necessary discussion on whether the *“Hydrogen Economy”* is just a dream or a real pathway to the future. The challenges to be faced during the transition towards the hydrogen economy were discussed.

Detailed report on this particular round table will be available soon but it can already be said that, whilst everybody agrees that the hydrogen era is a long-term vision, strong action must be taken in the short and medium term in order to address current environment and energy concerns. Electric and hybrid are the key technologies to be considered.

Finally, a third round table was devoted to analyze *“best practices in cities, programmes around the world, lessons and proposals for action”*.

American, Asian and European cities that are leaders in the field presented new mobility systems, new urban logistics concepts, results of projects demonstrating the merits of using battery and hybrid electric vehicles in urban frameworks, perceptions by regional and municipal authorities of these new solutions for their transport and environmental policy as well as the impacts on energy use and the need for suitable infrastructure.

This was the place to exchange ideas, to learn from others' experiences and to explore innovative solutions. Detailed report will also be available soon.

The closing session took place on the morning of Wednesday 6th April 2005 and was disrupted by the decease of HRH Prince Rainier earlier the day, so preventing the representative of Monaco to participate. The Pope also passed away this week, which put the EVS-21 on the second page of the media.

G. Maggetto, IPC Chairman and AVERE Vice-President in charge of European affairs, presented statistics of the symposium and Pietro Menga, President of AVERE, made a impressive speech showing that that we need to "*act now for sustainable mobility.*" He cited the city of La Rochelle which was successful at introducing EVs, as an example.

La Rochelle, Beijing and San Francisco were awarded for their active actions in favor of the introduction of EVs and Jacques Mollard, general manager of Technical Services of the city, showed electric deliveries being made by EVs. Mass transit was very efficient with electric trains in widespread use.

Shen Xiang then said that Beijing has set a goal to make it an electric city for the 2008 Olympics. He said they would have all electric buses ready by 2008. The center of EV technology is working hard to develop these buses as well as smaller electric vehicles. He said they are developing 4 different types of electric buses and presently have 50 000 EVs running around in Beijing. The buses are low-floor access design, which is also good for the disabled. He expects to have 1 000 electric buses in operation by 2008.

Rick Ruvulo, manager of the Clean Air Program for San Francisco, talked about the various EVs purchased by the city and said that partnership and perseverance with the auto companies and the public is key important for successful implementation of EVs. San Francisco partnered with the people of Nepal and Kathmandu for more than 600 EVs there running on hydro-generated renewable energy.

Joon Chulpark from Hyundai-Kia Corporation presented very promising EVs using NiMH or Li-Ion with Ultracaps for acceleration with a 300 Km range and a 150 Km/h max speed. He claimed for international partnerships for the hydrogen economy to come to fruition.

Finally, Theresa Martinet, sustainable delegate of the PSA Group, talked about future EVs or plug-in hybrid diesel having better fuel economy efficiency and being cheaper than fuel cell vehicles.

EVS-21 was closed by a video presented by Professor Hisashi Ishitani of Keio University in Japan, EVAAP President, inviting the delegates to EVS-22 that will take place in Yokohama, Japan, from 23rd to 28th October 2006.
