IEA INTERNATIONAL ENERGY AGENCY

HYBRID & ELECTRIC VEHICLE IMPLEMENTING AGREEMENT

www.ieahev.org

Newsletter 2006 - 1

September 2006

A word from the Chair: Give drivers what they want to drive

Dear reader,

In my daily work I have had dealings with two young entrepreneurs who own a successful company producing special metals for the Swiss watch industry. As entrepreneurs they are interested in future technological trends, and they believe that energy saving is crucial for the future. Their company building is heated by a cogeneration plant supported by solar collectors and biomass (wood) heating. They have installed grid-connected solar panels on the façade and the roof.

What kind of cars do these entrepreneurs use for business and personal driving? For years they used the small EV "Microcar" from France, but then looked for something better. For a short time they shifted to SAM-EVs from Switzerland. Then they found a way to utilize successfully two "Think!" EVs powered by photovoltaic electricity produced by the solar installations. They are very satisfied with the performance of these vehicles.

Of course, these entrepreneurs deal with rare materials from all over the world, so what is the choice for the normal car driver who is not so well connected? Actually, I drive a car with an average fuel consumption of about 3 litres/100 km. It is a fun to drive and saves a lot of diesel and money. If I had to replace this car, the "new best" vehicle would consume at least one additional litre of diesel per 100 km. Is this real “progress” in the car industry? If so, I’d better look for a used car of my current make.

In my spare time I fly a glider, which needs about one litre of gasoline for power to launch into airborne glides of hundreds of kilometres. This plane is built from plastics and carbon fibre. A new version using an electric motor and a lithium battery has been developed and is now available. Its efficiency is beyond anything else on the market. Meanwhile, we await something similar for road transport.

The automotive industry is not consistently showing itself to be capable of offering advanced internal combustion technology with better performance that also results in substantial reduction in fossil fuel consumption. From our perspective, advanced electric and hybrid vehicles are the solution. No wonder that, under ever-increasing oil prices, car companies with advanced hybrid technologies expand while those mounting redoubled effort to sell products bound to “gas guzzler” technologies suffer. Customers are willing to buy new products, but these products must be superior in both fuel efficiency and performance. Electric and hybrid vehicles meet this requirement (as fuel cell vehicles will have to do as well) and also increase the fun of the driving experience.

Urs Muntwyler, Chairman

In this issue

Synopsis of country activities: IA-HEV Experts' Meeting in Palo Alto, CA, USA

The IA-HEV conducted its 23rd Country Experts' Meeting in conjunction with the IA Executive Committee meeting in Palo Alto, CA on April 24. Representatives of seven member countries presented reports on activities relating to indigenous developments in EV and HEV technologies, policies, and marketing. As the host country, the United States made a special presentation covered in a separate article. Brief synopses of the other country presentations are provided below.

Country experts convene in Palo Alto, USA

Austria

The Austrian government's approach to vehicle research and development (R & D) funding incorporates both public-private partnerships and dedicated grants. The emphasis is to foster breakthroughs in any category of vehicle technology development, not just hybrids, and to pursue synergies between R & D policy and transport policy. The Austrian Agency for Alternative Propulsion Systems (A3PS) has initiated a four-pronged programme for Intelligent Transportation Systems & Services (IT2S) responsible for research covering intelligent infrastructure (I2), innovative railways systems (ISB), the A3 technology scheme described in prior expert meetings, and the Austrian Hydrogen and Fuel Cell Initiative (AHFI). This programme emphasises inter-disciplinary cooperation, education, and international partnerships. A3PS will discuss topics and organisation of programme calls with all relevant stakeholders in order to optimise the funding instruments, inform the public and stakeholders extensively and in detail about all national and international funding opportunities, analyse technological trends and evaluate technology foresight and assessment studies, and support the definition of interesting niches for Austrian research institutions within the technological development sphere. A3PS funds up to 35% of pilot programmes for advanced automotive technology (up to 100% of "lighthouse" project grants) which now include 21 projects in alternative propulsion research, a large share of which is focussed on hydrogen-power propulsion under AHFI. Currently, € 50 million is committed for the current fiscal year. Austria is well-suited to using electric-powered transport applications in order to meet Kyoto Protocol goals, as 70% of its electricity is generated from hydro power, but all available hydro power in Austria is being used, and additional hydro generation can be constructed only in sensitive areas, currently not an option.

Denmark

Because bio-energy potential in Denmark is now very efficiently applied in combined heat and power generation for stationary applications, the Danish government tends to reject the European Biofuels Directive for transport because it would reduce the nation's efficiency in its use of biomass as an energy carrier. The directive requires member countries to define a target value for their biofuel share in transportation, in case they are not able to meet 2005 (2%) and 2010 (5.75%) objectives. Denmark proposed a target value of 0% for itself, which was not allowed, so the lowest possible value, 0.1%, was chosen. Thus, no tax breaks are available for the purchase of biofuel-capable vehicles, but despite this, public and institutional pressure for their introduction is building through adoption of the EU regulation for share of biofuel sales.

The new Lexus luxury hybrid is sold as a van (rear seats can be removed), so it qualifies for tax incentives that the Prius does not, rendering it effectively cheaper than the Prius to purchase. Of 1.9 million total light-duty motor vehicles in Denmark, approximately 650 are EVs (300 4-wheelers and 350 City-el cars) and 35 are HEVs. Of a bicycle (2-wheeler) population of about 5 million, two thousand are e-bikes.

The national hydrogen research program is focusing not on vehicles but on stationary applications due to Denmark's high wind energy generation potential. Comprehensive research is going forward in biofuels, essentially in second-generation production processes such as enzymatic decomposition, but there is no current research in vehicle batteries and no EV or HEV component industry.

Italy

Italy has adopted very pro-active measures that involve EVs and HEVs to combat air pollution emergencies in cities. During such emergencies, EVs, HEVs and gaseous (NG, LPG)-fuelled vehicles can enter cities while other vehicles, especially those without emission catalysts or failing to meet EURO 2 standards, may not; this has been the case for about three years. (Air quality problems in Italy are generally seasonal, but highly pervasive when they occur.) At the same time, despite continuation of a 30 to 40 percent purchase discount for EVs, there is concern about negative media messages directed against BEVs and HEVs in favour of moving to hydrogen-based transport. Italy seeks to meet the EU commitment to 8% biofuel and 12% renewable fuel use targets by 2020, but will retain the 5-year property tax exemption on EVs for five years after purchase, followed by a 75% property tax discount for the remaining life of the vehicle. There are about 1,200 HEVs now on Italian roads even though the EV exemption is not available to them.

In general, support for alternative fuels continues to rely on local and regional government initiatives. In particular, the market for e-bikes has been stimulated (perhaps over-stimulated) by local and regional initiatives that outnumber incentives for other vehicle types to an amount of € 54 million in total subsidies. The central government, meanwhile, has committed 70 percent (€ 95 million of € 120 million total) of the budget for carrying out projects under the National Research Plan to support predominantly hydrogen and fuel cell development, an emphasis stimulated by the Europe-wide adoption of a common (fuel cell) platform that HEVs lack. ENEA and other Italian research centres are conducting many component- and application-related research projects in hydrogen production, storage, distribution, utilisation, and carbon sequestration.

The Netherlands

The Netherlands, like Italy, is emphasising environmental benefit, especially for air quality, as a rationale to promote AFVs and clean-fuel vehicles. Road capacity constraints militate against much significant net future growth in the motor vehicle population. Emission certification level and fuel consumption (CO2 emission) rating, indicated by car stickers, determine whether a vehicle may enter an urban area during an air pollution episode. Diesel vehicles are especially affected by the sticker programme because of particle pollution, and retrofitting of particulate filters to trucks is subsidised. Irrespective of fuel, fuel-efficient cars are granted annual registration and purchase tax reductions up to € 2.000/vehicle.

Research effort tends to focus on reductions of carbon dioxide emissions from the transport sector generally. Non-corporate vehicle-oriented R & D activity in the Netherlands will soon be significantly concentrated in the city of Eindhoven. Corporate automotive R & D is limited in size and scope, centred at the NedCar plant that assembles vehicles for Mitsubishi and Smart, at DAF Trucks, and at VDL. There is also a component and parts supply industry serving the heavy truck market.

The Eco-drive training and education project, designed to reduce petroleum consumption and carbon emissions, has been in existence for several years and is now extending to much of the rest of Europe as an EU project. Sustainability of fuel choice is an important issue. The number of gasoline, diesel, and LPG refuelling stations in the Netherlands has been decreasing, though still exceeds 4.000, but there are no public biofuel facilities. LPG cars and utility vehicles still number around 300.000, and there are some 300 CNG cars, including 200 being demonstrated in the Twente region. CNG use in transport is growing, but with no direct government support. There is a small number of electric cars (about 500) and HEVs on the road (some 5.000 Toyota Prius IIs, of which 2.700 were sold in 2005, were joined by the Honda Civic hybrid beginning January 2006), but diesel and gasoline cars dominate at about 1 million and 6 million units, respectively. The Netherlands boasts 20 million total bicycles in regular use, and a wide variety of e-bike makes and models is on offer (2005 e-bike sales were about 30,000).

Update: 11.09.06:
PACCAR, parent company of Dutch manufacturer DAF, has set an ambitious goal of 30% improvement in vehicle fuel efficiency for selected medium-duty applications over the next seven years. Hybrid technology will be a key contributor to achieving this objective. The company's comprehensive global hybrid program is aimed at commercializing energy management systems that provide benefits to both its customers and the environment. As part of this ambitious program, DAF Trucks has developed in co-operation with Eaton and

Leyland Trucks (also a PACCAR Company) a prototype hybrid distribution vehicle based on the successful LF series. The vehicle features a state-of-the-art parallel diesel/electric hybrid system. The hybrid system accumulates energy generated during braking and thus is particularly useful for stop-and-go distribution applications, making fuel savings of up to 30% possible. DAF Trucks' experience with hybrid systems goes back to the eighties, but those were hampered by the non-availability of lighter-weight battery systems. Now, thanks to the latest developments in battery technology a battery pack mass of only 150 to 200 kilos can deliver all the power needed by medium-duty applications.

Sweden

Swedish tax policy is oriented to company cars at this time, possibly because the personal consumer market for these vehicles is not yet significant and no new EV models are available, although there is lively trade in used EVs. Corporate purchase of a hybrid or electric vehicle qualifies for a 40 percent tax reduction relative to the nearest comparable conventional-fuel model; for a Toyota Prius, this represents about US $ 2.000 per year. Public authorities in Sweden must assure that 75 percent of their annual vehicle acquisitions are "green" cars as defined by the Swedish National Road Authority, but with no national grants available to purchase qualifying vehicles or cover incremental purchase costs, local grants provide some of this gap using national environmental project funds. Some local authorities have also reduced parking charges for "green" vehicles. The current Swedish on-road fleet includes about 360 EVs (down from 600 in 2000), 3.300 HEVs, 6.500 CNG or biogas light-duty vehicles, 23.000 ethanol/flex-fuel cars, 370 ethanol buses, 900 CNG or biogas buses and trucks, and 13 fuel-cell or all-electric buses.

The Swedish Transport Energy Management project and the more recent Green Car initiative are collectively responsible for 12 current and past hybrid- and drive-system projects, 5 system- and control projects, 7 fuel cell projects, 4 diesel reformer projects, 3 battery and 2 super-capacitor projects. The second phase of the Energy Management project is not involved in fuel cells, however.

Corporate research projects across major manufacturers are focused as follows:

- Prototype tracked military diesel-electric hybrids with individually controllable wheel motors
- Diesel-electric hybrid wheel loader (front-end pay-loader)
- Lead-acid battery-based hybrid medium- and heavy-duty trucks and buses
- (Possible) biofuel series hybrid for heavy application with supplemental super-capacitor power
- All-ethanol performance hybrid coupe.

At least twelve Swedish corporations are involved in the vehicle propulsion battery, advanced electronics, or fuel cell/hydrogen component supply business; one company is developing a new generation of railcars to transport pick-up/delivery hybrid trucks at 160 km/h in intercity transport.

Switzerland

The two surviving elements of the electric propulsion industry in Switzerland are (1) producers of lightweight EVs and high-speed electric bikes and (2) manufacturers of (outsourced) components for HEVs. Among the latter firms are Horlacher and Rieter (lightweight materials and composites), ESORO AG (lightweight bodies and components, now especially targeting hydrogen systems), MES (producer of the ZEBRA NaNiCl propulsion battery used in several import EVs), and BRUSA Electronics (motors, control systems, battery chargers, "coaster" technology).

CNG has a strong fleet and refuelling infrastructure presence in Switzerland, and CNG/electric hybrids are expected to make major inroads. The market for e-bikes is strong, with about 2.300 sold in 2005 to bring the licensed total to around 10.000 by the end of the year. Meanwhile, the market for 4-wheel EVs and HEVs remains modest. As of the end of 2005, there were 710 EVs, 472 Prius I and 1.543 Prius II HEVs, 275 Lexus RX 400h SUVs, and 179 Honda IMAs in a Swiss 4-wheeled fleet of some 4,18 million. Of 652 thousand 2- & 3-wheelers plus some 230 thousand mopeds, there are 2.000 licensed EVs in addition to the 10.000 e-bikes. Some 400 heavy-duty EVs are on the roads, plus 4.500 HD industrial and agricultural EVs. Two (import) 4-wheeler EV brand/models remain in the Swiss market as well as two 3-wheelers, two scooter models, and seven models (five marques) of e-bikes.

Several major transport R & D projects feature alternative propulsion technologies and/or fuels: greater emphasis on biomass ethanol and ethanol blends; building ground-up 4-wheel (CEV—Clean Energy Vehicle; CLEVER methane prototype with starter-generator) and 3-wheel CNG prototypes; development of a multi-purpose mobile (MUPUM) platform for public service vehicles such as waste hauling, school buses, and snowploughs; and a Li-ion powered ultra-light scooter. In addition, several cantons are individually or collectively conducting promotions partially funded by the Federal Office of Energy for greater use of fuel-efficient vehicles, e-bikes, better driving habits, and a climate levy on fuels for transport (7 centimes per litre fuel). Vehicle tax reductions have been granted for EVs in 16 cantons, solar vehicles in 4 cantons, hybrid vehicles in 8 cantons, CNG vehicles in 4 cantons, and fuel cell vehicles in one canton. Four cantons plan to exempt taxes on vehicles achieving a carbon dioxide emission rate less than 100 g/km.

Actual penalties for excess GHG emissions could be introduced in Switzerland within the next few years: carbon dioxide taxes as a multiplier of the basic levy (1,3x for gasoline, 1,9x for diesel) are scheduled to be implemented *if* CO_2 reduction targets of 3%/year (from yr. 2000) are not met by June 2007.

Focus on host country: USA policies and progress in HEV technology and markets

The United States (USA) hosted the most recent Executive Committee and Annex 1 experts' meetings. The USA continues to be the world leader in hybrid vehicle sales, thanks in part to tax incentives supporting these sales in addition to high gasoline prices. Hybrid technology has also made inroads in the heavy-duty (diesel) vehicle market.

As of mid-2006, almost 550,000 light-duty (cars and light trucks) hybrid vehicles had been sold in the USA since their commercial introduction in 2000. Sales in 2006 exceed 140,000, a pace well ahead of 2005's record sales, with the popular Toyota Prius II (and earlier Prius I) leading all marques at almost 300,000 total units sold (170,000 just since the end of 2004). Hybrids have achieved significant inroads in the sport-utility (SUV) market, with about 105,000 sold in just under two years. In addition to the Prius, four marques (Honda Civic, Ford Escape, Toyota Highlander and Lexus RX400h) have exceeded 30,000 in total sales. The decline in HEV sales noted in the early months of 2006 was attributable more to supply shortage/long wait times for delivery than actual decline in demand, although any moderation in gas prices (as occurred in a late 2005 transient situation) tends to induce the US market back into "traditional" buying patterns. Nevertheless, HEV sales surged again in March 2006, with Ford's Escape and Mercury Mariner HEVs making surprisingly strong and consistent gains since their late 2005 introduction.

MERCURY MARINER HYBRID

LEXUS RX400h HYBRID

HONDA ACCORD HYBRID

The U.S. Energy Policy Act's variable tax incentives for fuel-efficient vehicles are certainly playing a role in demand. Tax credits for qualifying currently-available hybrids range from $250 (Chevrolet Silverado/ Sierra hybrid) to $3.150 (Prius II), based on net petroleum fuel saving. Of the "greenest" vehicles available in the US market, according to the American Council for an Energy Efficient Economy, three are hybrids. Any vehicle failing to meet low emissions certification goals for its type and weight class will NOT qualify for credits. On this basis, no diesels can currently earn credits, and future "mild" hybrids (from GM) are also

not expected to qualify. In what appears to be an emissions-related strategy, Nissan will introduce its 2007 model Altima HEV with emissions conforming to SULEV requirements in the nine states that have adopted California's LEV II regulations.

For all technologies there is a limit by manufacturer on how many total vehicles sold can actually earn the tax credit, a provision that helps producers that have not yet introduced hybrids and also limits the amount of U.S. tax dollars used for subsidy.

In addition to the federal incentives, at least 20 states have regulations that, in effect, promote HEVs, usually by providing incentives, such as a high-occupancy-vehicle (HOV) freeway lane privilege, an emissions inspection waiver, tax credits/rebates, or state fleet purchase directives.

Diesel electric hybrids are successfully competing with alternative fuel transit buses to reduce urban emissions and oil consumption. Transit fleets are historically more comfortable with diesel technology, and the introduction of clean (ultra-low sulphur) diesel fuel is enabling diesel hybrid buses to achieve emission certification levels across all criteria pollutants comparable to those boasted by gaseous fuels. Overall, U.S. urban transit bus hybrids in service are superior to current diesels with respect to fuel consumption (though less so than dynamometer tests implied they would be). A statistical review of recent urban transit bus tests completed at the National Renewable Energy Laboratory indicates that, with respect to diesel cars and trucks, simple extrapolation of hybrid transit bus results is not appropriate: the mileage gap between conventional diesel powertrains and hybrid diesel powertrains closes if average vehicle speeds exceed 20 mph and much start-stop "urban creep" operation is eliminated—not often possible in standard transit bus operations.

GENERAL MOTORS DIESEL HYBRID TRANSIT BUS

Despite discontinuance of production by major manufacturers, there remain about 60,000 road-legal battery EVs in service in the USA. This number has actually been growing modestly thanks to sales successes by niche producers such as GEM (A Daimler-Chrysler subsidiary) and ZAP Corporation.

Original IA-HEV web address restored; new members-only area created

Argonne National Laboratory - the Operating Agent for Annex I on Information Exchange - is pleased to report that the merged and updated web site for the Implementing Agreement and Annex I can once again be accessed at its original Internet address, www.ieahev.org, and the "look and feel" of the site are fully restored to an IA-HEV context, rather than appearing as a subordinate of its institutional host. At the request of the IA-HEV Chair, to provide premium content exclusively for dues-paying signatories to the Implementing Agreement, a password-accessed "members-only" area has been created. This area contains the minutes and graphical/pictorial presentations of all ExCo and Annex I meetings as well as a page display file of the most recent IA-HEV Annual Report. It also has the capability to include recent or proprietary information on HEV developments not available to the general public.

In addition to the newsletter and updated events calendar, as well as announcements and news from the various Annexes the site has added an "Expanding HEV Universe" feature that summarises significant developments in hybrid and electric vehicle and components technology, marketing, and public policy in both member and non-member countries over the most recent few months

Chris Saricks, Operating Agent, Annex I

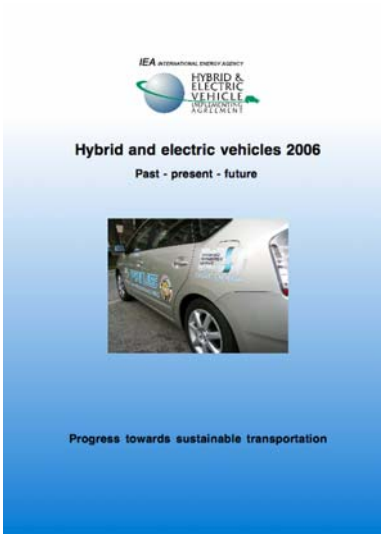
Annual report more informative

The new IA-HEV annual report *Hybrid and electric vehicles 2006* is now available. For the first time, the annual report is a merger of the annual reports of the Executive Committee and of Annex I (Information Exchange), making the new annual report even more informative.

The report covers the latest achievements of the running IA-HEV Annexes on Information exchange, Hybrid vehicles, Electrochemical systems, and Electric cycles. Plans are disclosed for new Annexes on Heavy-duty hybrid vehicles, Lessons learned in market deployment, Renewable energies for HEVs, and Fuel cells for

vehicles. The chapters on IA-HEV member countries have a new structure that improves the accessibility of the information. In addition to these country chapters, this year a worldwide overview on hybrid and electric vehicles, a look at HEVs in selected non-member countries, and an outlook for the HEV market are included.

This report is a must for those who want to be updated on hybrid and electric vehicles. Contact your country delegate (see at the end of this Newsletter) or the IA-HEV secretary Mr. M. van Walwijk at secretariat.ieahev@wanadoo.fr for your free copy.



Martijn van Walwijk, Secretary

New Annex XI (Electric cycles) activities get rolling along

The inaugural IEA-IA-HEV Annex XI meeting took place on 10 and 11 March 2006 in conjunction with the Light Electric Vehicle International Conference organized in conjunction with the Taipei Cycle Show. Participants enjoyed several tours including a visit to two-wheeler-related research facilities. As part of the weekend activities, attendees travelled to central Taiwan, and to Sun Moon Lake, largest lake in the country and located in the central mountains. It is a famous tourist attraction with exquisite scenery but also a rich cultural heritage and resources. Several rental stations for electric cycles there offered electric mopeds developed in the USA and for the past two years produced in Taiwan. The participants also visited ITRI, a non profit R&D organisation with 6 000 employees engaged in five areas of applied research and industrial services.

On 28th June 2006, some of the Annex XI partners visited the Sparta electric bicycle production facilities in the Netherlands. With a sales figure of 30 000 units in the third year of mass production, the Sparta Ion has achieved unique European market success for powered two-wheelers, an achievement realized without any governmental support. This fact shows that the market introduction of e-bikes is possible by an manufacturer alone provided that the external conditions are favourable.

The first annual progress meeting of the Annex was conducted in the "Espace Mobilitiés Electriques" in Paris, just after the Bibendum Challenge of 8 to 12 June 2006. The Challenge has for several years presented a unique opportunity for participants to discuss items related to clean vehicles and to test and drive the latest battery, hybrid and fuel cell vehicles. The presence of two-wheelers was important and they attracted lot of the public's attention, especially during the parade held at the champs de Mars, just under the Eiffel Tower. At one of the Bibendum Challenge's round tables, all experts present agreed that urban mobility problems could be solved only by developing vehicles adapted to the cities and that, therefore, electric bicycles and scooters will have a critical role to play in the future.

The second Annex XI progress meeting will take place on 24 October 2006 in conjunction with the 22nd Worldwide International Battery, Hybrid and Fuel Cell Electric Vehicle Symposium & Exhibition (EVS-22) in Yokohama, Japan, in the vicinity of Tokyo R&D. The Annex will arrange interviews with Yamaha, Honda and Suzuki during EVS-22.

Participating nations/organizations of Annex XI currently include the USA, Switzerland, Tokyo R&D, AVERE and ITRI. It is hoped that for the reasons stated below the following countries will in particular become contracting parties:

- ***Italy***, because of its prior experience with incentive policies to promote acquisition and use of electric two-wheelers;
- ***The Netherlands***, because of its long and well-established biking culture; and
- ***France***, which has recently set up a working group on the issue.

Frédéric Vergels, Operating Agent, Annex XI

New Annex -- "Deployment Strategies: Lessons Learned"

When we look back over the past 20 years of EV and HEV developments, we see the arrival and departure of many new models for which market introduction failed in almost all cases. This may explained partly by factors that are well known (e.g., low market acceptance of low range vehicles, costs, technical problems), but questions remain about the full reasons for such failure. It is important to analyze the stories behind the failures to learn how to avoid repeating these failures in the future market introduction of clean vehicle technologies such as fuel cell vehicles. Lessons from the past applied to the future can preclude bad investments and more effectively direct government support.

The Implementing Agreement for Hybrid and Electric Vehicle Technologies and Programmes plans to establish a new Annex to investigate the stories behind a successful or not successful market introduction of clean vehicle models and to formulate recommendations for future clean vehicle marketing. The scope and work plan of this Annex will be discussed at a workshop to be conducted on October 28, 2006 at the international Electric Vehicle Symposium (EVS-22) in Yokohama, Japan. It is anticipated that the workshop will also provide the forum necessary for concluding groundwork to launch this new Lessons Learned annex.

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Clean vehicle awards at EVS-22

All readers of the IA-HEV Newsletter and other interested parties are heartily invited to attend the second 'IA-HEV clean vehicle award' ceremony that will be held during EVS-22 in Yokohama, Japan, October 23-28, 2006. The ceremony is sponsored by the US Department of Energy (DOE), who is one of the members of this Implementing Agreement.

Since 1993, the IEA Implementing Agreement on Hybrid and Electric Vehicles has been fostering information exchange and co-ordinated research on an international level in the field of clean vehicle technologies. During this time, clean vehicle technologies and their components have made remarkable progress, and production vehicles have become available on the market. This continuous progress is driven by committed persons, teams and manufacturers. Therefore IA-HEV has decided to award those who dedicate their work to the dream of a clean and energy efficient vehicle technology. The award is presented in three categories:

- The 'Clean vehicle award' is granted to manufacturers with outstanding sales figures.
- The 'Best practice award' is granted to the organizers of an outstanding promotion project.
- The 'Personal award' is granted to a person that has dedicated her or his work to the development or promotion of clean vehicles in an outstanding way.

The IA-HEV team would be pleased to see you in Yokohama for celebrating the winners of these awards.

Key messages on hybrid and electric vehicles in the new IEA publication "Energy Technology Perspectives. Scenarios & Strategies to 2050"

The *Energy Technology Perspectives* is a response by the IEA technical staff to the Group of Eight (G8) leaders at their Gleneagles Summit in July 2005, and to the International Energy Agency's Energy Ministers who met two months earlier. Both groups called for the IEA to develop and advise them on alternative scenarios and strategies aimed at a *c*lean, *c*lever and *c*ompetitive energy future. *Energy Technology Perspectives* presents the status and prospects for key energy technologies and assesses their potential to make a difference by 2050. It also outlines the barriers to implementing these technologies and the measures that can overcome such barriers.

Hybrid vehicles a promising technology

Improving energy efficiency in the transport sector is of special importance, since this sector consumes the bulk of oil products and has the fastest growing emission profile. Hybrid vehicles can provide impressive fuel savings and emission reductions. Full-hybrid configurations (if combined with technologies that improve the efficiency of powertrains and other technologies that reduce engine loads) could by 2050 consume as little as half the total energy of that by today's gasoline vehicles. The prospect for overcoming the hybrid cost premium to the

consumer is improved in the near term by the availability of various "degrees" of hybridisation (full, mild and light), suitable for different vehicle classes, which adds into the design latitude that can help contain costs. Batteries are responsible for a large fraction of the cost penalty of hybrid vehicles. Improved battery technology can help reduce this penalty and boost the diffusion of plug-in hybrids, a possible key to the electrification of transport systems.

In the Baseline Scenario conducted for this study, light and full hybrids each make up 10% of the light-duty vehicle stock in 2050. In the Map (best target) scenario, 85% of light-duty vehicles on the road in 2050 are powered by a full (20%), mild (20%) or light (45%) hybrid powertrain. Just over a third (35%) of medium freight trucks and 75% of buses would have (diesel) hybrid engines in the Map scenario. The efficiency improvements derived from power train hybridisation (coupled with regenerative braking, smaller engine size, and increased time spent in the ICE's optimal operating range) result in about 265 million tonnes of oil equivalent (Mtoe) of fuel savings. This could well be greater than the potential reduction in fuel demand achieved in that year by dedicated fuel cell vehicles, given the later commercial availability of fuel cell propulsion technology.

IA-HEV conference: focus on future HEVs

IA-HEV is scheduling a conference that aims to flesh out a vision of the future of hybrid, electric and fuel cell vehicles. The conference will bring together governmental policy makers and specialists of IA-HEV member and non-member countries who are working on HEVs and FCVs. Conference participants will exchange knowledge of and experience with policies that stimulate the introduction of HEVs and help HEVs become available on the market. The provisional programme includes contributions from IEA representatives, policy makers in the field of energy, representatives from the energy and automotive industries, IA-HEV country delegates and IA-HEV Operating Agents. The outcome of the conference will contribute to the IEA & G8+5 objectives regarding information exchange on energy issues. The conference will be held at the IEA headquarters in Paris, during the second half of April 2007.

Persons interested in participating are invited to contact Ms. S. Kleindienst Muntwyler at info@solarcenter.ch The IA-HEV Newsletter and the IA-HEV website at www.ieahev.org will update and add details about the conference in the future.

IA-HEV Country Delegates for 2006

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Annex XI: Electric Cycles

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Agenda/Upcoming events

September 6 – 7, 2006

Annex VII, *Hybrid vehicles* Expert meeting, Delft, the Netherlands

October 24, 2006

Annex XI, *Electric cycles* Expert meeting, Yokohama, Japan (in conjunction with EVS-22)

October 25, 2006

Workshop to establish *Fuel cells for vehicles* annex, Yokohama, Japan (in conjunction with EVS-22)

October 28, 2006

Organisational strategy and planning workshop, *Lessons learned* annex, Yokohama, Japan (in conjunction with EVS-22)

October 30, 2006

Annex I, *Information exchange* Expert meeting, Yokohama, Japan (in conjunction with EVS-22)

October 31 – November 1, 2006

IA-HEV Executive Committee meeting, Yokohama, Japan (in conjunction with EVS-22)

April 26-27, 2007 (tentative)

International Energy Agency special "G8+5" conference on future development and prospects for efficient vehicles: "Towards Sustainable Transportation," Paris, France

Colophon
This electronic Newsletter is produced by IEA's Implementing Agreement on Hybrid and Electric Vehicle Technologies and Programmes (IA-HEV). For information about the agreement and for contributions to this Newsletter, please contact the IA-HEV secretary Mr. Martijn van Walwijk at: secretariat.ieahev@wanadoo.fr or Mr. Chris Saricks, Operating Agent, IA-HEV Annex I at: csaricks@anl.gov.