IEA INTERNATIONAL ENERGY AGENCY
HYBRID & ELECTRIC VEHICLE IMPLEMENTING AGREEMENT

NEWSLETTER – Volume 3, Issue 2

June 2002

A word from the Chair

Urs Muntwyler
Chairman

The Executive Committee meeting of October 2001 seems a long time ago, and the next one in Korea seems some time in the future. In the meantime, our task forces have been working hard on their programmes. Mr. Mansson has obtained substantial financial and administrative support for the workshop on Clean City Vehicles in Developing Countries on September 24,25 at IEA headquarters in Paris. Annex 8 on Deployment Strategies have completed their draft report, and are now finalizing it. Annex 7 on Hybrid Vehicles has held two Expert meetings in January and April, and is working on the 2002 report. Annex 1 on information exchange had a good meeting in March in Sophia Antipolis, France, where the former Operating Agent (NEDO) handed over to the new one (VTT). Our new web-site is now on-line, and will continue to be expanded and improved.

We also welcome the new participants, Denmark has obtained the budget approval to join the Agreement, and China has requested to participate as an observer in our meetings.

This issue of the newsletter will describe some of the on-going work and recent events, as well as providing some general information about hybrid and electric vehicles and government programmes.

INSIDE THIS ISSUE

Major Workshop on clean vehicles in Paris September 24,25

Tommy MANSSON
Interim Operating Agent, Annex 9

A major workshop will be held in Paris to strengthen our links with developing countries interested in cleaner air in large cities. The Swedish International Development Agency (Sida) has made funds available to allow about 20 participants from developing countries to travel to Paris. The IEA Secretariat is providing the meeting facilities and strong support, the Swedish Energy Administration (STEM) is helping with the organization, and, of course, our Implementing Agreement is also providing financial support.

We expect that there will be about 40 to 60 participants from IEA and developing countries, from industry, governments, and research organizations. The objective will be to establish a global network which will give developing countries better access to clean vehicle technologies and programmes being implemented in IEA countries, and which will give IEA countries valuable

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Deployment of Clean Energy Vehicles – draft report completed

Sigrid Kleindienst
Operating Agent, Annex 8 – Zollikofen, Switzerland

The draft final report of our joint Annex on Deployment strategies is now ready and was discussed at our Experts meeting in Vancouver on June 10 and 11. We conducted an extensive survey of 75 Government programmes aimed at testing and demonstrating clean

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Deployment of Clean Energy Vehicles

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vehicles. Each of the four sub-tasks concentrated on a smaller number of case studies (about 15) to do a more detailed analysis.

The first sub-task studied fleet tests, which are defined as using a relatively small number of innovative vehicles under real operating conditions, in order to gain field experience with the technology. The analysis covered objectives, level of success, barriers, diffusion measures, and side effects. Recommendations are made on fleet test design, assessment, and follow-up.

The second sub-task studied the role of government in the introduction of innovative vehicle technologies. It investigated whether it was more effective to attempt to "steer" car markets through control measures such as legislation, or whether it was preferable to "network" among the major stakeholders in the automobile market. A comparison of 22 case studies showed that objectives were often unrealistic or poorly defined, that corporate learning could be improved, and that financial incentives often had a disappointing level of impact. The detailed recommendations favour network management, specific programme design improvements, and corporate learning improvements.

The third sub-task analysed the role of each of the major stakeholders, and made recommendations on how they can work together more effectively to achieve clean air objectives.

The fourth sub-task is a synthesis of the first three, and also adds some original recommendations on improved market deployment programmes.

Our aim is still to complete the final report by December of this year. ♦♦

Major Workshop on Clean Vehicles in Paris

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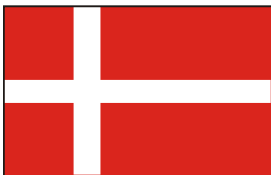
information on the experience of developing countries in this area. Information will flow in both directions, for example Brazil has the largest ethanol fuelled vehicle fleet in the world, and Argentina has the highest percentage of CNG vehicles in the world. The workshop will discuss what types of practical collaboration could be set up or strengthened, including the possibility of starting up a new Annex in this area.

Executive Committee members will receive information on this workshop, other readers of this newsletter who are interested can contact me at <tommy.mansson@enen.se> ♦♦

Welcome to Denmark



The Danish Environmental Protection Agency of the Ministry of Environment and Energy has received budget approval to participate in our Implementing Agreement. The formal application process is now under way.

Denmark has consistently been a world leader in innovative energy and environmental policies, in wind energy, and in electric vehicles. We welcome Denmark to our Agreement, and look forward to working with our Danish colleagues in the future. ♦♦

The U.S. FreedomCAR program sets technical goals

Tien Q. Duong
U.S. Department of Energy

The FreedomCAR program was announced by U.S. Secretary of Energy Spencer Abraham on January 9, 2002 in Detroit. The "CAR" in the name stands for "Cooperative Automotive Research" and indicates that this is a partnership between the U.S. Government and the automotive industry. More recently, the technical goals for the program have been set. The more interesting ones are:

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Freedom CAR Technical Goals

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- The cost target for the fuel cell is $ 45 /kW by 2010 and $ 30 /kW by 2015.
- The electric propulsion system should have a 15 year life, should deliver a peak power of 55 kW for 18 seconds, and continuous power of 30 kW. The cost should be $ 12 /kW peak.
- For hybrid vehicles there are targets for the energy storage device that include a 15 year life span, a cost of $ 20 /kW, and energy storage of 300 Wh with a discharge power output of 25 kW for 18 seconds.
- For the hydrogen supply infrastructure, the targets are 70% energy efficiency well-to-pump; cost of energy from hydrogen equivalent to gasoline at market price, assumed to be $1.25 per gallon
- For all personal vehicles, there is a target of a 50 % reduction in weight of vehicle structure and sub-systems, at affordable prices and with increased use of recyclable/renewable materials.

The complete list of goals can be found on the web-site: www.cartech.doe.gov/freedomcar/technical-goals.html . ♦♦

Hybrid Vehicle Annex will disseminate its reports widely

Robert Winkel
TNO, Delft – The Netherlands

Many Annexes in different Implementing Agreements face the decision on whether to keep the results of their work restricted to those who did the work and paid for it, or whether to disseminate their reports widely since they are paid for by public funds. For Annex VII it was initially decided to publish the overview report widely, and to keep the special topics reports restricted to participants. However, both of these reports have now been combined into one publication, and a new decision was required. A fax vote was held, and it was unanimously agreed that all reports should be disseminated widely. Accordingly, these reports in CD-ROM format will be available from myself on request, and they will also be posted on the Agreement's web-site.♦♦

China interested in Hybrid and EV Agreement

At our Executive Committee meeting in Beijing in October 1999, Professor Lun Jingguang of Tshinghua University gave a presentation on electric vehicles in China. More recently, Mr. Hanns-Joachim Neef of the IEA Secretariat had meetings with Chinese government officials in May of this year. The Chinese Government has informed us that they wish to become formal observers to our Agreement. The Secretary has invited Professor Lun Jingguang and other interested Chinese officials to participate as observers in our next Executive Committee meeting in Busan, Korea and also in the Annex meetings that will be held at that time. ♦♦

New Annex on Renewable Energy for Transportation

Frans Koch
Secretary

Most of the work that has been done in the field of renewable energies for transportation has been in biofuels. The Advanced Motor Fuel and Bioenergy Implementing Agreements are working on biodiesel, ethanol, etc. and these can, of course, be used in hybrid vehicles to obtain a sustainable transportation energy chain. For fuel cell vehicles, the Hydrogen Implementing Agreement is studying ways of producing hydrogen sustainably. The IEA Secretariat is bringing this information from diverse sources together, and working on a report on renewable energy for transportation. The various technologies seem to be well covered by existing I/A's, but the question remains on how to bring these technologies onto the market and into widespread use. There might be opportunities for innovative programs, for example to link wind energy with electric or plug-in hybrid vehicles, or to link bio-diesel or ethanol to charge sustaining hybrid vehicles. The link would not be a physical or technical one, but rather an innovative program that would create win-win situations. Executive Committee members or other readers of this newsletter who have suggestions in this area are requested to communicate them to the Chairman or the Secretary. ♦♦

New Annex on 2 and 3 wheel - , and neighborhood Electric Vehicles.

Frans Koch
Secretary

The optimism of the early 90's that battery electric vehicles would capture a large share of the market has now dissipated. However, almost unobtrusively, battery electric vehicles have established themselves in some market niches including electric bicycles and scooters, electric three wheelers, and neighborhood electric vehicles. Reaching full market potential in these niches could make an important contribution to reducing emissions, noise, and traffic congestion, especially if they substitute for two-cycle engines and for car trips. There are definitely issues to be considered, such as the mixing of electric bicycles and neighborhood EV's with other traffic, safety, and special infrastructure such as special parking places. Organizations interested in studying these issues are requested to contact the chairman or secretary. ♦♦

Is the time ripe for a model sustainable city?

Rob Winkel
TNO – Delft, The Netherlands

In our Annex 7 on Hybrid Vehicles, we are faced with technologies that are very close to being competitive, and hence the issues of raising public awareness and gaining market share are very important. One idea that we discussed was to encourage the construction of a model "city" which would use only sustainable transportation technologies. The concept would be similar to the "car free" tourism villages in Austria and Switzerland, but on a much larger scale. The word "city" would have to be interpreted somewhat loosely, it would be more like a new neighborhood or something like an Olympic village. The model city would be a showcase for all the renewable energy technologies and for the most efficient end uses of energy. It would be built so that the inhabitants could enjoy almost all the comforts of the 21st Century, but in a sustainable way. It would no doubt be necessary to associate a certain rural area with this city, where biofuel and other crops could be grown and wind turbines could be built.

Our discussion within the hybrid vehicle Annex pointed out the need to expand the market beyond the environmentally conscious segment of the public, which in most countries is less than ten percent of the total. A model city which proves that it is not necessary to reduce the level of comfort to be sustainable, and which has the added luxuries of clean air and reduced noise, could achieve this. It could convince that segment of the population which is not ready to pay more unless they get some sort of added advantage in return. An Olympic village might be a particularly good starting point, because of the high media exposure it receives.

We could discuss this idea with other Implementing Agreements, and see where it leads us. ♦♦

Saving Oil and Reducing CO_2 emissions in Transport – Book review

Frans Koch
Secretary

The IEA report entitled "Saving Oil and Reducing CO_2 emissions in Transport – Options and Strategies" was written by Lew Fulton, with contributions from Michael Landwehr, Celine Marie-Lilliu, and Lee Schipper, they may be known to readers of this newsletter. In a word, the study demonstrates that there are plausible scenarios for achieving the Kyoto targets, except for the time target which is shifted to 2030.

The study considers how fuel economy can be improved through the introduction of hybrid and fuel cell vehicles and continuing improvements in internal combustion engines. It estimates when these technologies would reach the point of cost competitiveness, with and without government taxation measures, and what their impact would be on oil consumption and CO_2 emissions. Of key importance is whether heavier vehicles such as minivans and sport utility vehicles will continue to hold, or even increase, their market share. This is unpredictable, and so several scenarios are assumed in which the vehicle fleet will get heavier, will stay the same, and will get lighter. The more positive scenarios include a strong market penetration by hybrid vehicles during the next

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Saving Oil and Reducing CO_2 emissions in Transport – Book Review

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two decades, and by fuel cell vehicles during the second and third decade, resulting in oil savings and CO_2 reductions to nearly the Kyoto levels by 2030.

The study also discusses policy measures and programs aimed at a more efficient use of cars through better maintenance, driver education, speed limits, improved traffic flow, etc. The experience gained with such programs shows that several programs in combination can have a significant impact. Other sections of the report deal with reducing the amount of vehicle travel, alternative fuels, and freight movement. The study is a concise (187 pages) analysis of the main factors affecting oil consumption and CO_2 emissions of the road vehicle sector.

The descriptions of the past and present situation are based on statistical evidence, and it would be difficult to disagree with any of it. It is only when the future is considered that those interested in hybrid and electric vehicles might suggest a more optimistic scenario. For example, it is assumed that fuel cell vehicles will become cost competitive in about 10 years, and that internal combustion engines will continue to improve. Yet for hybrid and electric vehicles, major improvements are not assumed. If it is plausible that the future cost of fuel cells will be one tenth of the present cost, why not the cost of batteries or supercapacitors? The report makes overly modest assumptions about the number of hybrid vehicles that will be on the road in 2005 and 2010, and assumes that a new vehicle model is required to introduce new drive train technologies. As the introduction of the hybrid Honda Civic has shown, this is not necessarily true. Overall, the treatment of hybrid vehicles seems overly condensed. For the purposes of the analysis it was assumed that there would be one kind of hybrid vehicle which represented a kind of average of the various hybrid vehicles on the market and under development. The report would have benefited if a distinction were maintained between different market segments, between charge sustaining and plug-in hybrid vehicles, and if the possibility of electricity from the net were included as one form of future transportation energy.

In the discussion of policies and measures to improve fuel efficiency, the car buyer is treated a little too rationally as someone who seeks to satisfy his pre-defined tastes at lowest cost. This avoids the central problem, that the car buyer is subject to strong fashion trends. This is the single most important factor affecting oil consumption and CO_2 emissions. Changing the fashion in a politically acceptable way should have the highest policy priority, but unfortunately the report does not go into this area.

The report is well researched, and contains many tables, graphs, and statistics, but at the same time it is still highly readable. It provides a clear overview of where we are today and what the future could hold in store. The scenarios that show that the Kyoto targets can be achieved (in the long term) are especially welcome in view of wide spread skepticism on this point. The report costs $ 125 and can be ordered from the IEA on its web-site.

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Our web-site: www.ieahev.org

Frans Koch
Secretary

The revised web-site came on line in May. We shall continue to improve and expand the site by doing more work on the current sections, adding reports from the Annexes such as the hybrid vehicle reports and deployment strategies reports, and by activating the members-only section. Your comments and suggestions on how to further improve the site will be welcomed, please send them to the Secretary. ♦♦

Electric Vehicles as a stepping stone to car free tourism – a model project in Austria

Dr. Romain Molitor
TRAFICO Consulting, Austria

The Alps are not only renowned for their scenic beauty, they are also an ecologically sensitive area. Large parts are threatened by pollution caused by increasing car traffic. Because of this, a consortium of Austrian Ministries, communities, a province, and the European Union have launched a model project in the field of environment, tourism and mobility. The communities

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Electric rental car for guests in Werfenweng

are Bad Hofgastein (population 6,800) and Werfenweng (pop. 650) near Salzburg, Austria. The number of tourist beds exceeds the number of inhabitants in both cases, and visitors come mainly from Germany, Austria, the Netherlands and Belgium. The objectives of the project are to create a high-quality recreation experience "car-free tourism", to encourage innovative traffic concepts and transport technologies, to keep ICE vehicles out of village centres, and to improve environmental quality. Since the start in 2000, a total of 99 electric vehicles have been subsidised (51 e-scooters, 30 e-bikes, 3 light electric vehicles and 15 e-cars), and one of the first solar charging stations for electric vehicles in Austria was set up.

In Werfenweng all electric vehicles are operated by the local tourism association for rental to guests and inhabitants. Special attention is focused on fun cars (Velo-Taxi, Fun Rider, Biga). For excursions in the region, 2 Renault Clio's and 3 Peugeot e-scooters have been acquired. In Bad Hofgastein electric vehicles are used for professional purposes, such as delivery, hotel use, and by the local tradesmen. For those purposes and also for general use, 14 electric vehicles for commercial use and 28 Peugeot e-scooters have been purchased. For tourism, a number of e-bikes and e-scooters have been acquired by a group of hotels.

A recent evaluation showed that a shift from ICE vehicles to electric vehicles is possible for selected purposes in hotels and in businesses (e.g. trade, craft), if the additional costs are off-set by grants. Buyers and users can be convinced through information campaigns and vehicle test runs that demonstrate the reliability and capabilities of electric vehicles. The EV's have proven successful in commercial use and the range of about 100 km is sufficient for local delivery. Vehicle maintenance can be done locally. About 7% of business trips are now done by EV's.

The environmental evaluation covered energy use, emissions of air pollutants and green house gases, and noise. The EV's used 72 % less energy than diesel powered cars, and in Austria electricity comes from renewable sources (hydro power). CO_2 emissions are reduced by 96% and NO_x emissions by 99% compared to conventional vehicles. Based on the daily number of "business" trips starting from Bad Hofgastein, the energy consumption was reduced by 5.1%, CO_2 emissions by 6.7% and NO_x emissions by 6.5%. If all business trips were done by electric vehicles, the CO_2 emissions could be reduced by 13%, equal to the Austrian target for the Kyoto Protocol. Noise reductions in villages centres can also be expected but have not yet been evaluated.

In conclusion, the introduction of 99 electric vehicles in only 2 years in the two communities was quite successful. The interest in electric vehicles is still high in both communities. The tourists have more fun with the electric scooters and bikes and enjoy the cleaner air and lower noise. The environmental improvements are quite encouraging, and could be replicated in other tourist destinations.

♦♦


E-scooters in Werfenweng

Transfer in Leadership of Information Exchange Annex

Sari Nobell
VTT – Espoo, Finland

An Annex I Expert meeting was held in Sophia Antipolis, France, on March 7,8, 2002. It was the final meeting of the Annex under the leadership of NEDO which has done a tremendous job since the very first meeting in La Rochelle, France on June 8,9, 1993. From now on, VTT will be the Operating Agent, and we look forward to continuing the work that started 9 years ago. On behalf of all participants, I would also like to thank our gracious hosts, Patrick Coroller and Stéphane Biscaglia of ADEME. ♦♦

Supercapacitor testing methods, work in progress

Nils Stelzer
ECHEM, Wiener Neustadt, AUSTRIA

Participants in Annex 10 on Electrochemical Systems are working on the survey and analysis of super-capacitor testing methods. We shall be discussing this work at our next Expert meeting in Busan. ♦♦

CALENDAR OF EVENTS:

ANNEX 9 – CLEAN CITY VEHICLES WORKSHOP: SEP. 24-25, 2002 – PARIS, FRANCE

EVS-19: OCT. 20-23, 2002 – BUSAN, SOUTH KOREA

ANNEX 10 – ELECTROCHEMICAL STORAGE SYSTEMS – EXPERT MEETING –

OCTOBER 23, 2002 – (AFTERNOON) BUSAN, SOUTH KOREA

ANNEX 1 – EXPERTS' MEETING

OCTOBER 24, 2002 – BUSAN, SOUTH KOREA

ANNEX 7 – HYBRID VEHICLES – EXPERT MEETINGS

SEPTEMBER 2002 IN SWEDEN

HYBRID AND ELECTRIC VEHICLE EXECUTIVE COMMITTEE MEETING

OCTOBER 25,26, 2002 – BUSAN, SOUTH KOREA

Personal News

- Welcome to Thomas HOWES, our new IEA officer. His e-mail address is: Tom.Howes@iea.org and his phone number is: +(33) 1 40 57 67 89
- There has been a re-organization within the Energy Efficiency and Renewable Energy Office of the US Department of Energy. Under the new organization, Ray Sutula will head the solar energy office. We would like to thank Ray for the strong contributions he has made to our Implementing Agreement, and wish him all the best in his new job. ♦♦

Enquiries and Correspondence:

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