

R&D-cooperation for HEV and BEV in A3PS, EU-TPs and IEA

Dr. Andreas Dorda

Hybrid and electric vehicles, energy storage technologies
and control systems

National and international R&D-projects, research institutions and funding programs

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in cooperation with **bmw** and **arsenal research**
Ein Unternehmen der Austrian Research Centers

Content of Presentation

- Austrian Agency for Alternative Propulsion Systems
- Automotive industry in Austria
- National and European framework conditions and policy goals
- Funding instruments of the Austrian Ministry for Transport, Innovation and Technology
- Marketing and networking for A3PS members in FP 7, EU-technology platforms and the International Energy Agency

Austrian Agency for Alternative Propulsion Systems

PPP between industry, research and technology policy as strategic cooperation for the development and market introduction of alternative propulsion systems and fuels

- Additional support activities for industry and research beyond public funding of R&D projects.
- Stimulating the co-operation of complimentary partners in order to overcome the “chicken and egg problem”.
- Building up interdisciplinary research co-operations and comprehensive and trans-sectoral demonstration projects.
- Compiling and summarizing all available information on alternative propulsion systems.
- Analyzing technological trends and evaluating technology foresight and assessment studies.

Austrian Agency for Alternative Propulsion Systems

- Creating supportive framework conditions (funding budget for R&D-Programs, privileged access to sensitive areas, fuel taxation, codes, emission targets or technical standards) in order to avoid barriers for innovation.
- Discussing topics and organization of BMVIT program calls with A3PS members in order to optimize the funding instruments.
- Informing extensively and in detail about all regional, national and international funding opportunities.
- Harmonizing regional and national research activities in order to avoid duplication of efforts and to achieve a critical mass in the international perception.

Austrian Agency for Alternative Propulsion Systems

- Supporting the definition of interesting niches for Austrian research institutions within international development and R&D processes.
- Facilitating the integration in national and international networks as well as participation in FP6 projects and other research activities.
- Safeguarding interests of A3PS members in international fora like EU-technology platforms, ERA-NET's, IEA,...
- BMVIT as neutral partner for all stakeholders and facilitator in joining consortia or integrating technology users in demonstration projects by public procurement.
- Promoting all alternative propulsion systems and fuels (HEV, BEV, FCV, biofuels, CNG, hydrogen, ...)

Austrian Agency for Alternative Propulsion Systems

- A3PS pursues no own research but supports R&D institutions by information-, research- and cooperation management.
- Focusing on vehicle technology but taking aspects of environmental and energy policy and technologies into account (sustainability in fuel production, Kyoto commitment, security of supply,...).
- Reducing development risks by promoting multi-use technologies with economic value beyond vehicle applications (improved electric motor, electronics, simulation, material research,...).
- The early stage in the innovation cycle offers small countries and companies high economic opportunities and strong impact on the developing process.

Austrian Agency for Alternative Propulsion Systems

- Clear distinction of the thematic promotion of A3PS and its strategic partnership with industry and research from the operational duties of the Austrian Research Promotion Agency FFG (evaluating proposals, signing contracts, funding projects and controlling their results).
- Marketing for Austrian technology expertise and the engineering and product know-how of the members by publications and presentations at conferences.
- Providing additional support to Austrian R&D institutions by A3PS employees.
- Making BMVIT confident to invest so heavily in this technology field by assembling already 27 partners in the Agency.

Austrian Agency for Alternative Propulsion Systems



- Giving Austrian research institutions a long-term security in planning and investments due to a clear public commitment beyond election terms.
- Pursuing a technology breakthrough in a key area of the energy and transport industry by gaining synergies in a strategic and determined public private partnership between industry, research institutions and policy makers.

27 Members of A3PS:



Industrial Partners:

AVL List

Magna Steyr

OMV

Plansee

Fronius International

GE Jenbacher

AustriaTech



University Institutes

- University of Natural Resources and Applied Life Sciences
- TU Vienna - Institute for ICE and Automotive Engineering
- TU Vienna - Institute of Chemical Technology and Analytics / Electrochemistry
- TU Vienna - Institute of Electrical Power Systems and Energy Economics
- TU Vienna - Institute for Thermodynamics and Energy Conversion- ITE
- TU Vienna - Institute of Chemical & Process Engineering
- TU Graz - Institute for ICE and Thermodynamics
- TU Graz - CD - Laboratory for Fuel Cell Systems
- TU Graz - Institute of Electrical Measurement and Measurement Signal Processing

SME's and Research Institutes

- ALPPS Fuel Cell Systems
- Bitter Group
- HyCentA Research
- Joanneum Research
- Arsenal Research
- Austrian Research Centers
- ECHEM - Centre for Applied Electrochemistry
- Profactor Group
- Austrian Bioenergy Centre
- Biovest Consulting
- Austrian Hydrogen Association

A3PS - Portfolio

- Stimulating the cooperation of complimentary partners, building up interdisciplinary research co-operations and trans-sectoral demonstration projects.
- Providing, compiling and analyzing information (technology foresight and assessment, studies, lectures, workshops, conferences, travel reports,...).
- Creating innovation friendly framework conditions (Regulatory- and fiscal policy, fuel taxation, endowment of research programs, 7. FP, codes and standards, emission limits, access to sensitive areas,...).
- International networking and marketing for Austrian R&D competence and the product and engineering Know How of A3PS members.

Automotive Industry in Austria

- Automotive Industry is a global key industry sector and one of the most successful branches in Austria
- More than 175.000 employees
- Turnover of 35 Billion€/a (>10% of GDP)
- High competence on the drive train (AVL, BMW, GM-Opel, Magna, KTM,)
- Change of the drive train has direct and strong impact on Austrian industry
- Change is already visible
 - Trend towards electrification of the drive train
 - Successful introduction of hybrid cars

European Framework Conditions

- White Book of the European Commission
 - CO₂-emissions of the transport sector 1990 to 2010 will increase by 50% to ca. 1.113 Mrd. t.
 - More than 30 % of the total European energy consumption is allotted to the transport sector
 - Dependency of the transport sector from crude oil (about 98 %) must be decreased by alternative energy sources

European Policy Goals

- Reduction of greenhouse gases (as of 1990) by at least 20% by 2020
- Increasing energy efficiency by 20% until 2020
- 20% renewable energy by 2020
- Reduction of fleet emission to 120/130g CO₂/km until 2012
- Further tightening emission standards for emissions of pollutants (EURO 4, 5, 6,...)





A3 (Austrian Advanced Automotive Technology)



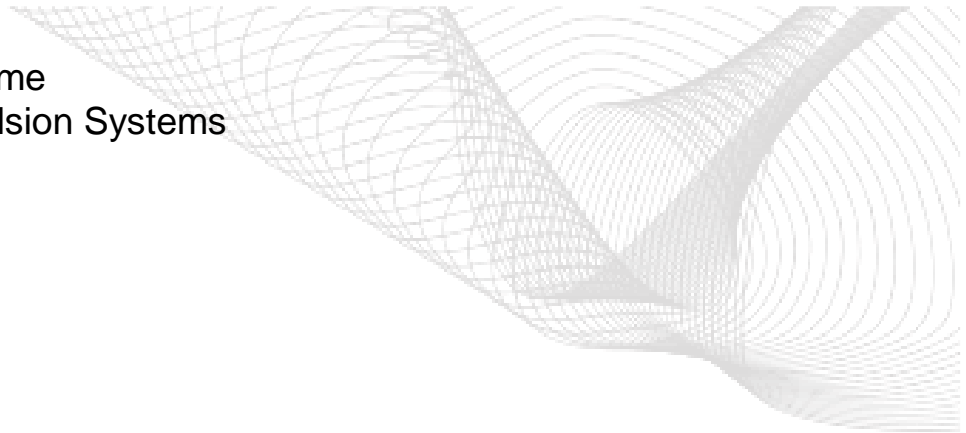
- 4 calls for proposals (2002-2006)
 - 152 Proposals
 - 78 projects approved (international evaluation)
 - Total project volume 39.6 Mio. €
 - Promotion of 20.4 Mio. €

- 2 calls for Lighthouse Projects (2005 and 2006)
 - 25 Proposals
 - 8 projects approved (international evaluation)
 - Total project volume 7.4 Mio. €
 - Promotion of 3.4 Mio. €



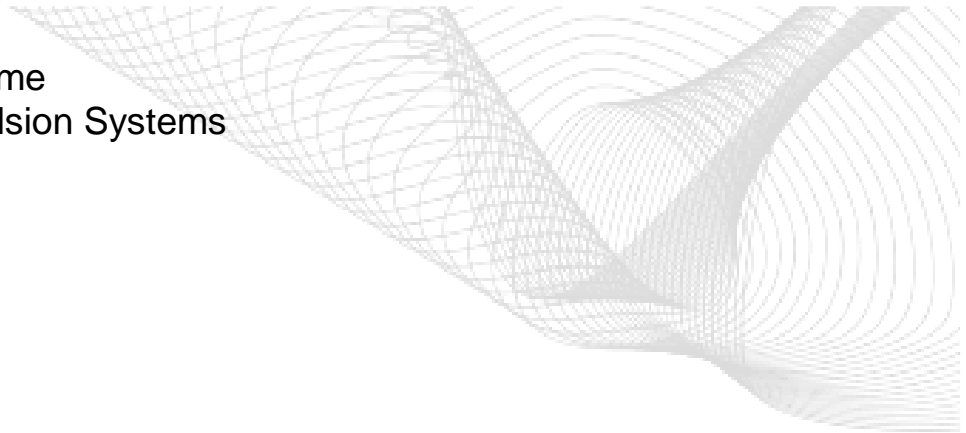
A3 Lighthouse Projects:

- Content:
 - Large pilot and demonstration projects with attractive funding
- Goals
 - Optimization of alternative propulsion systems and fuels under real life conditions through a close cooperation of developers and users
 - Preparation of the public for technological changes in the energy and transport sector



A3plus Program

- Focusing on alternative propulsion systems for all land transport modes
- Funding R&D and lighthouse projects
- 3 calls in 2007 and 2008
- 57 proposals received.
- 21 projects (including 3 lighthouse projects) approved in the first 2 calls by international evaluation. Third call will be evaluated until end 2008.
- 12 M € funding volume.



A3plus Program

- Alternative propulsion systems and components, incl. engine control
- Alternative fuels (liquid, gaseous / fuel combinations)
- Innovative storage concepts for gases, liquids, electricity
- Development and promotion of necessary supply infrastructures
- Concepts for embedding alternative drive trains in the overall vehicle design (physical layout with reference to weight, volume and transport safety)

BMVIT funding follows the following principles (1)

- Broad Selection of funding schemes for individual needs of R&D (FWF, Bridge Program, FFG, K-plus, COMET, Seed financing, AWS, Climate & Energy Fund, ...).
- Neutral position concerning different technological options.
- Neutral position concerning different applicants.
- Confidentiality during evaluation process in order to secure IPR's of applicants.
- Grants awarded according to the competitive principle through invitation for proposals.
- Stimulation and use of synergies from the cooperation of complementary partners.
- Integration of future users of technologies in the development process.

BMVIT funding follows the following principles (2)

- Integration of know-how beyond the automotive industry in the engineering process.
- Fundamental technology change instead of incremental improvements.
- Promotion of the whole innovation cycle from studies to demonstration projects, creation of new education concepts, preparation of the public for technological changes.
- Optimization of the overall vehicle system by tuning of subsystems.
- Optimization of the transport system through intermodal and interoperable connection of transport carriers.

International Cooperation and Networking



- IEA-Implementing Agreement “Hybrid & Electric Vehicles”
- IEA-Implementing Agreement “Advanced Motor Fuels”
- IEA-Implementing Agreement „Advanced Fuel Cells“
- EU-Technology Platform ERTRAC
- EU-JTI “Fuel Cells and Hydrogen”
- EU-Technology Platform BIOFUELS (Chairman of Mirror Group of National Delegates)
- EU-R&D-Framework Program 7

IEA HEV Annex XIII „Fuel cells for vehicles“

- Full coverage of all relevant options for the electric drive train
- International co-operation reduces the danger to overlook regional technological trends or results in the global development process
- Cooperation allows combining the strengths of different partners in a coordinated R&D process
- Current Members
 - Austria A3PS – OA of Annex XIII
 - Switzerland PSI
 - USA NREL
 - Interest from Germany, Italy, Denmark, Japan
 - Close cooperation with Annex XX of IA-AFC
- Working Method / Output
 - Expert meetings, Workshops, ... Final Report '09



IEA HEV Annex XIII „Fuel cells for vehicles“

- General introduction
- Fuel Cell Vehicle Technology (components, configuration, operating experience)
- Current R&D Programs, Market Situation, Trends and Potential (industrial and national programs, barriers for market introduction, sustainability issues, energy storage, comparison with HEV and BEV technologies)
- Conclusions
- General Information and Dissemination

Contact

Dr. Andreas Dorda

Managing Director of the
Austrian Agency for Alternative Propulsion Systems (A3PS)

Tel.: +43-1-205 01 68 100

andreas.dorda@a3ps.at

www.a3ps.at

and

Deputy Head of Unit “Mobility and Transport Technologies” at
Austrian Ministry of Transport, Innovation and Technology

Tel.: +43-1-711 62 65 31 09

andreas.dorda@bmvit.gv.at

www.bmvit.at