



European Commission



Invitation to the
First World Materials Summit
on
**Materials Research:
Key to Meeting Energy
Needs and Climate Change**

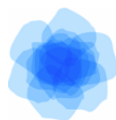
Topics 2007: Mobility, Future Energy Supply

4 – 5 Oct. 2007

Lisbon – Portugal

Hotel Corinthia

Av. Columbano Bordalo Pinheiro, 105 - Lisboa – Portugal
www.corinthiahotels.com – email: lisboa@corinthia.pt



PORTUGAL 2007

Presidência Portuguesa da União Europeia 2007 - Evento de interesse científico - Ciência 2007UE

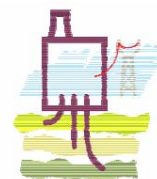
<http://www.fct.mctes.pt/pt/eu2007/>

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EuMaT

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ZEP Technology Platform
Zero Emission Fossil Fuel Power Plant

CONTRIBUTORS:

- European Science Foundation (ESF)
- European Technology Platform on Advanced Engineering Materials and Technologies (EuMaT)
- Federation of European Materials Societies (FEMS):
 - DGM
 - Sociedade Portuguesa de Materiais (SPM)
- International Union of Materials Research Societies (IUMRS):
 - A-MRS (Materials Research Society of Australia)
 - B-MRS (Brazil Materials Research Society)
 - C-MRS (Chinese Materials Research Society)
 - E-MRS (European Materials Research Society)
 - MRS (Materials Research Society, USA)
 - MRS-T (Materials Research Society of Taiwan)

ABOUT EMF:

The European Materials Forum "EMF" is a non profit organization integrating the major materials related scientific organizations in Europe, as well as certain industries.

EMF FOUNDING MEMBERS:

All European Academies (ALLEA)
European Academy of Sciences and Arts (EASA)
European Federation of Scientific and Technical Networks of Cooperation (FER)
European Materials Research Society (E-MRS)
European Neutron Scattering Association (ENSA)
European Physical Society (EPS)
European Science Foundation (ESF)
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Federation of European Materials Societies (FEMS)
Freiburger Materialforschungszentrum (FMF)
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Materials Research: Key to Meeting Energy Needs and Climate Change

First World Materials Summit for a Cooperation Agenda of the Global Materials Community

October 4th and 5th, 2007

Background for the meeting

The alarming information published in the United Nation Report and other previously published information concerning Global Warming refer largely to the production and use of energy in industry, housing, food production and mobility. For minimising worldwide climate change we must urgently invest our scientific technical knowledge to support the essential change in all fields of human activity to ensure mankind moves towards a sustainable future. This cannot be achieved simply by incremental improvements. It is only by an elementary change including - fundamental research and the development of new technologies, to be implemented in new products, procedures, rules and behaviour at the system level will the future be assured.

Materials Research and Advanced Materials are probably the most important key elements to develop the required new technologies needed to provide a clean, reliable supply of energy saving and efficiency as well as the means of transportation and infrastructures needed to achieve a more sustainable climate concept.

The organisers

Since global warming affects the entire world, solutions have to be imagined by involving the researchers from all around the world. Since Europe is at the front edge of this battle, the European Materials Forum took the initiative to launch this inaugural World Materials Summit in Europe in close collaboration with the concept initiator, the International Union of Materials Research Societies (IUMRS) and its member organisations. The support of the European Science Foundation (ESF) was the seed for this conference. The financial sponsors are currently: ESF, ALSTOM, E-MRS and IUMRS.

Goals of the conference

This conference is planning to initiate a coherent organisation to achieve worldwide scientific and technological cooperation in Materials Science and Technology to accelerate the introduction of actions to slow the increasing rate of CO₂ emissions. It is the first of a series of meetings that are intended to evaluate the contribution of the worldwide Materials Research Community in the short, medium and long term.

Focus on Transport and Mobility

This first meeting will open with specialists from the major industrialised countries involved in the problems of climate change giving a world wide perspective of the general policy adopted in their area of responsibility. After these presentations the focus of the meeting will concentrate mainly on the application of innovative Materials for Transport and Mobility, including the sources of Energy and Energy Efficiency. Increasing industrialisation and globalisation demand greater demands for the transportation of goods and people for the foreseeable future. This implies that Transport and Mobility' will need to play a significant role in the efforts to mitigate the emission of greenhouse gases contributing to global warming. Such mitigation can be achieved only by the application of new methods of construction, propulsion and fuels technology – all of which will involve the applications of materials science research.

Expected results

It is recognised that if the emission of all greenhouse gases were stopped it will not be possible to reverse the process of climate change. Indeed the demands of man are such that further climate change is inevitable. The meeting will generate visions on an international level and milestones for the principal materials science and technologies that can contribute significantly to the control and reduction of global warming. Following the anticipated interdisciplinary debate between the invited players from Industry, Politics and Research, the Organisers will formulate an agenda in which the most urgent requirements will be presented in a possible time frame, to motivate the worldwide materials community to work intensively, together and to share their findings..

Creation of the Materials Research and Technology Milestone Agenda: Lisbon 2007

EMF and its partners intend to prepare, as a first step, an *International Materials Milestone Agenda to combat Climate Change* focusing on cooperation between scientists from all over the world. in Materials Science and Technology. In addition it is intended to develop a fully scientific materials objective report to ensure that the materials science input to the world's actions to combat climate change are fully exploited, The purposes are to push the limits of the future emerging technologies and to begin the race for intelligent mankind to battle against the perdition of our planet. This Milestone Agenda and the Materials Objective Report will be documents for the global orchestration, as seen by the Materials Science Community, in specific fields and will be presented to both the authorities and the general public.

Materials Research: Key to Meeting Energy Needs & Climate Change

Programme

Wednesday evening, October 3, 2007

18:00 **Registration**

Opening session

Chairman: *Michał Kleiber*

19:00 **Introduction**

José Mariano Gago

Minister for Science, Technology and Higher Education, Lisbon, Portugal
Chairman of the E.U. Research Council

Main objectives of the meeting

Michał Kleiber

President of EMF and President of the Polish Academy of Science, Warsaw,
Poland

Address on behalf of the European Science Foundation

*John Marks / Patrick Bressler**

CEO, European Science Foundation (ESF), Strasbourg, France

* Head of Unit, Physical & Engineering Sciences (PESC), ESF

Address on behalf of IUMRS

Gabriel Crean

President, International Union of Materials Research Societies, Cork, Ireland

20:00 **Dinner**

Thursday morning, October 4, 2007

Strategic Materials Worldwide

Chairpersons: *Mildred S. Dresselhaus*
Maria da Graça Carvalho

Keynote lecture

08:45 – 09:15 **The Hydrogen & Fuel Cells Joint Technology Initiative - A material step towards a New European Energy Technology?**

Herbert Wancura

Board Member and Vice-Chair, European Fuel Cells and Hydrogen Industry Grouping, Director of ALPPS Fuel Cell Systems GmbH, Austria

09:15 – 09:35 **Materials and sustainable development in China**

*Changxu Shi, Yafang Han**

President, Council for National Science and Technology Library
Senior Advisor, National Natural Science Foundation of China

* Professor, Beijing Institute of Aeronautical Materials

09:35 – 09:55 **Energy Futures and Sustainability: The Role of Materials in Australian Solutions**

James Williams

School of Physical Sciences & Engineering,
The Australian National University, Canberra, Australia

09:55– 10:15 **Brazil views**

Fernando L. Freire Jr.

Departamento de Física, Pontifícia Universidade Católica do Rio de Janeiro, Brazil

10:15 – 10:35 **Materials Challenges in Fission and Fusion Reactors for Energy Sustainability: Indian Scenario**

Baldev Raj

Director, Indira Gandhi Centre for Atomic Research, Kalpakkam Department of Atomic Energy, Tamil Nadu, India

10:35 – 11:05 **Break**

Address on behalf of the President of the European Commission

Maria da Graça Carvalho

Principal Adviser, Bureau of European Policy Advisers (BEPA),
European Commission, Brussels, Belgium

11:15 – 11:35 **Materials Research and Climate Change: International Perspectives**

Martina Otto

Head of Energy and Transport policy, UNEP Division of Technology, Industry and Economics, Paris, France

- 11:35 – 11:55 **USA views**
Alexander A .Karsner (to be confirmed)
U.S. Department of Energy, Washington, DC, USA
- 11:55 – 12:15 **Taiwan’s Situation and Countermeasures**
Gou-chung Chi
National Central University Jhong-Li, Taiwan
Jain-Long Horng
Industry Technology Research Institute, Hsinchu, Taiwan
- 12:15 – 12:35 **Comprehensive and systemic approach in the policy and R&D activities for efficient and cost-effective renewable energy substances, materials and systems for Africa's socio-economic growth**
A.C. Beye
CEO, The African Laser Centre, CSIR South-Africa
- 12:35 – 13:00 **Questions from the audience and Discussion**
- 13:00– 14:30 **Lunch**

Thursday afternoon, October 4, 2007

Selected Advanced Materials for Transportation Applications

Chairperson: *Alan J. Hurd*
Justin Adams, rapporteur

Session: Fuel Cells

- 14:30 – 14:55 **Advanced materials for advanced propulsion systems**
Jürgen Friedrich
Senior Manager, Fuel Cell Drive System Development, DaimlerChrysler AG
- 14:55 – 15:20 **New Materials in Advanced Powertrains**
Wolfgang Steiger
Group Research Director Powertrain / Volkswagen AG, Wolfsburg, Germany
Jörg Huslage
Responsible for Fuel Cell Stack Development
- 15:20 – 15:45 **Materials Performance/Degradation and Materials Development Needs for Low-Temperature Fuel Cells**
Hubert A. Gasteiger
Fuel Cell Activities, General Motors Corporation / Development Director, Catalyst Technology, at ACTA S.p.A., Cascina, Italy

15:45 – 16:10 **The Construction of the Future Motor Vehicles - Hybrid or Fuel Cells or both? Collaboration of scientists and engineers are the key for the breakthrough technologies onto a winner on road.**

Katsuhiko Hirose

Project General Manager Fuel Cell Development Division, TOYOTA Motor Corporation, Toyota, Japan

16:10 – 16:40 **Questions from the audience and Discussion**

16:40 – 17:10 **Break**

Session: Light Weight Materials

Chairperson: *Ivan S. Silaev*

Yafang Han, rapporteur

17:10 – 17:35 **Light weight vehicles through advanced materials**

Robert F. Singer

Professor and Director, Universität Erlangen-Nürnberg und Neue Materialien Fürth GmbH, Germany

President, Federation of European Materials Societies (FEMS), London, UK

17:35 – 18:00 **The Future of Aircraft Structures: Challenges and Trends**

Denis L. Balaguer

Head for new technologies, EMBRAER S.A., Sao Jose dos Campos, SP, Brazil

18:00 – 18:25 **Processing and Application of Light Weight Hybrid Structures**

Dirk Bormann

Head of Department Biomedical Engineering and Light Weight Structure, Institute of Materials Science, Leibniz-University, Hanover, Germany

18:25 – 18:50 **Magnesium Alloys for Transportation**

Pan Fusheng

Deputy Director of Chongqing Science and Technology Commission

Director of Chongqing Engineering Research Centre for Magnesium Alloys

Professor, College of Materials Sc. & Engineering, Chongqing University, China

18:50 – 19:15 **Questions from the Audience and Discussion**

Summing up: *Jean Pierre Massué, George Smith, Alan J. Hurd*

20:30 **Dinner**

Friday morning, October 5, 2007

Advanced Materials for Energy Supply

Chairperson: *Martina Otto*
Paul Waide, rapporteur

08:30 – 08:55 **Future Energy Challenges and Opportunities**

Justin Adams

Director, Technology Strategy & Venturing
BP p.l.c. International Headquarters, London, UK

08:55 – 09:20 **Renewable Energy for Supply**

Stan Bull

Associate Director for renewable electricity science and technology,
National Renewable Energy Laboratory, Denver, Colorado, USA

09:20 – 09:45 **The Strategic Research Agenda of the European PV Technology Platform and its link with advanced materials development**

Jozef Poortmans

Director, Depart. “Solar and Organic Technologies”, IMEC, Leuven, Belgium
Photovoltaic Platform member

09:45 – 10:15 **Break**

10:15 – 10:40 **A Feasibility Study of Sustainable IGCC in Taiwan**

Y. P. Chyou, Y.S. Lee, L.F. Lin

Director, Institute of Nuclear Energy Research (INER), Longtan, Taoyuan,
Taiwan

10:40 – 11:05 **Materials Research on Hydrogen for Meeting Future Energy Needs**

Mildred S. Dresselhaus

Department of Electrical Engineering and Computer Science and Department of
Physics, Massachusetts Institute of Technology, Cambridge, USA

11:05 – 11:30 **Advanced Materials for a Sustainable Nuclear Energy Supply**

Frédéric Schuster

Director of Materials Program, Commissariat à l’Energie Atomique (CEA), Gif
sur Yvette, France

11:30 – 12:00 **Questions from the audience and Discussion**

12:00 – 13:30 **Lunch**

Friday afternoon, October 5, 2007

Materials and Energy Efficiency

Chairperson: *Katsuhiko Hirose*
Peter P. Schepp, rapporteur

13:30 – 13:55 **Overview of New Materials for Energy Efficiency**

Paul Waide

Senior Policy Analyst, Energy Efficiency and Environment Division,
International Energy Agency (IEA), Paris, France

13:55 – 14:20 **European Materials: The pathway towards Zero Emissions**

Klaus Schneider

Member of the Steering Committee of the European Technology Platform
“EuMaT”, General Manager, MTS AG Switzerland

14:20 – 14:45 **Efficient Electricity Generation through Advanced Materials**

Erich Tenckhoff

Energy Technology, Consultant, Erlangen, Germany

14:45 – 15:10 **Towards Future Fuel Reduction in Aircraft Design**

Dieter Schmitt

Head of Research, Airbus, Toulouse (*until July 2007*)

15:10 – 15:35 **Strategy for developing future leaders in Energy and Environment**

R.P.H. Chang

Secretary General, International Union of Materials Research Societies
Northwestern University, Evanston, USA

Panel Discussion: the Lisbon 2007 Declaration

16:30 **Moderator:** *George Smith, University of Oxford*
assisted by Chris Grovenor, University of Oxford, UK

Participants: *Mildred Dresselhaus, R.P.H. Chang, Gabriel Crean,*
Katsuhiko Hirose, Alan J. Hurd, Michel Maréchal, Paul
Siffert, Ivan S. Silaev, Paul Waide

20:00 **Farewell Buffet**