



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY  
CINCINNATI, OHIO 45268**

**ANNUAL MEETING REPORT OF  
THE NATO CCMS PILOT STUDY ON  
CLEAN PRODUCTS AND PROCESSES**

**May 1-6, 2004  
Budapest, Hungary**

The 7<sup>th</sup> annual meeting of the NATO CCMS Pilot Study, Clean Products and Processes, was held at the Budapest University of Economic Sciences and Public Administration in Budapest, Hungary from May 1 to 6, 2004. The University was also home for the Hungarian Cleaner Production Center, directed by Dr. Gyula Zilahy, a professor at the University and the Hungarian representative to this CCMS Pilot Project. At present there are 31 countries involved in this pilot, 27 of which sent their representatives to this meeting. The meeting was organized and very ably run by the host Prof. Gyula Zilahy. The meeting was sponsored by NATO CCMS, US EPA, and the Budapest University of Economic sciences and Public Administration. This was the largest meeting of the Pilot thus far. Typically one delegate per country attends this meeting. However, United States of America, Israel, Czech Republic, Georgia, and Hungary each had more than one attendee at this meeting. We started at 2 pm on Sunday afternoon (May 2) with a greeting by Dr. Sandor Kerekes, Dean of the Budapest University of Economic Sciences and Public Administration. Delegates from four new member countries shared their cleaner production and sustainability concerns and activities. These new countries are Canada, Egypt, Croatia, and Georgia.

We had a great get-together among the delegates who benefited from frequent exchanges of ideas for collaboration. Several proposals for collaborations were made earlier and they were reviewed for updates and interest (discussed later). We visited several plants that practice cleaner production and were also greeted by Prof. Tamas Meszos, Rector of the Budapest University of Economic Sciences and Public Administration. The goals of Phase II of this Pilot were reaffirmed:

- S To promote cooperation for improving the common pollution landscape by stimulating cross-national dialogues and collaboration
- S To share knowledge on the methods, tools, and technologies for making cleaner and sustainable products and processes possible

Here is the summary of the various activities:

On Sunday May 2 the program started at 2 pm with the introduction of the delegates, overview of the meeting agenda, a report of the 2003 meeting report (by Alessandra Criscuoli of Italy), an open

Forum (by Subhas Sikdar, USA) on the status of the proposed projects for multi-country collaboration. The active Phase II projects are:

- Sustainability metrics and reporting mechanisms. Leader: A. Fet (Norway). Cooperating nations: USA, Turkey, Greece, Slovenia, Lithuania, Germany, Hungary, Romania, UK, Portugal, and Italy.
- Train the trainers, implement environmental management accounting (EMA). Leader: G. Zilahy (Hungary). Partnering nations: Slovenia, Ukraine, and Lithuania
- Education and training in sustainable development. Leader: Peter Glavic (Slovenia). Partners: USA, Portugal, Germany, Poland, Spain, Bulgaria, Israel, Denmark, Italy, South Africa, Turkey, and Lithuania
- Cleaner Production policy in transition economy countries. Leader: W. Zadorsky. Partners: Germany, Hungary, Romania, Sweden, Bulgaria, and Norway
- Indicators for potential new sustainable technologies. Leader: E. Drioli (Italy). Partners: USA, Russia, Israel, Portugal, Slovenia, Romania, Denmark, Poland, Greece, Hungary, Turkey, and Spain.
- Waste Minimization Clubs. Leader: Chris Buckley (South Africa). Partners: Ukraine, Portugal, Israel, Slovenia, USA, Czech Republic, Bulgaria, and Turkey.

A few new ideas for projects were also proposed. Before next year's meeting, these new ideas would be firmed up and team members chosen.

On Monday we began a session with talks on invited special topics of relevance to the Pilot. They were

- Speaker: Prof. D. Bhattacharya, University of Kentucky, USA. Talk: Functionalized membranes for separations
- Dr. John Cihonski, Kreido Laboratories, California, USA. Talk: Spinning reactor applications in process intensification
- Prof. Farhang Shadman, University of Arizona, USA. Talk: Update on environmentally benign semiconductor manufacturing

This was followed by several reports by fellow Pilot Study members:

- Teresa Mata (Portugal): Designing environmentally sustainable chemical processes
- Prof. Gueorgui Kagrananov (Russia): New flotation processes and equipment for wastewater purification
- Col. Ales Komar and Dr. Frantisek Bozek (Czech Republic): Measures of cleaner production in food industry and their environmental benefits
- Prof. Aysel Atimtay (Turkey): Comparison of the application of BREFs in EU member and candidate countries

A scheduled field trip in the afternoon took us to meet the Hungarian Environmental Minister at the Hungarian Parliament. The Hon. Minister apprised us about the environmental protection work going in

Hungary.

Tuesday May 4 was scheduled for a field trip to visit three industrial sites where cleaner production is practiced. These were Herendi Porcelain Manufacturing, Guntner Tata Ltd (an industrial heat exchanger manufacturer), and Szollosi Wine Company.

On Wednesday May 5 we were greeted by the Rector of Budapest University. This brief event was followed by our one-day special symposium. This year's theme was environmental education, which was suggested in last year's meeting in Italy by Prof. Peter Glavic of Slovenia and supported by a number of delegates. This symposium was divided into four sessions, the first two chaired by Dr. Gyula Zilahy (Hungary) and the latter two by Teresa Mata (Portugal).

Session I:

- Dr. Peter Glavic (Slovenia): Education in Environmental Engineering in Europe
- Dr. Sandor Kerekes (Hungary): Future of environmental education in Hungary
- Dr. Antonio Martins (Portugal): Educating for sustainability – challenges and trends

Session II:

- Dr. Laszlo Valko (Hungary): Environmental education in Hungary
- Dr. Gilbert Rochon (USA): Education in sustainable production in U.S. universities
- Ronald Kontar (Hungary): Environmental education in Slovakia
- Dr. Zsuzsanna Szerenyi (Hungary): Environmental education at the Budapest University of Economic Sciences and Public Administration
- Prof. Chaim Forgacs and Prof. David Wolf (Israel): Education in Israel on sustainability

Session III:

- Prof. Akos Redey (Hungary): Implementation of management systems in higher education
- Dr. Jurgis Staniskis (Lithuania): Experience of international M.Sc. program in environmental management and cleaner production
- Dr. Gabor Onodi (Hungary): Environmental issues in agricultural higher education
- Prof. William Zadorsky (Ukraine): About training of technicians at high schools in Ukraine for realization of sustainable development concepts

Session IV:

- Dr. Henrik Wenzel (Denmark): Sustainable industrial production – undergraduate course on methods and tools in industry's environmental work
- Prof. Jim Swindall (UK): Marie Curie Host Fellowship for early stage research training

Each session was followed by a questions/answers period. A large number of attendees were local, comprising students and teachers. Several presentations were made in Hungarian, and simultaneous

translations in English and Hungarian were provided. It was decided that a select number of the presentations from this symposium will be published as a special issue of the journal, Clean Technologies and Environmental Policy, published quarterly by Springer-Verlag.

On Thursday May 6 we had more presentations on projects being carried out by individual members of the Pilot.

- Dr. Annik Fet (Norway): Sustainability metrics and reporting mechanisms in the European region
- Dr. Henrik Wenzel (Denmark): Environmental assessment of enzymatic biotechnology – case on the application of phytase to pig feed
- Prof. Jose Coca (Spain): Characterization of adsorbents for VOC removal by inverse gas chromatography
- Prof. Susete Dias (Portugal): Update on the use and capabilities of constructed wetlands

The rest of the time on Thursday was spent on discussing Pilot businesses. We resumed discussions on the new Phase II projects (presented before) and all the projects were decided to go forward. The delegates also discussed ways of getting funding to implement these projects. Several ideas on funding were presented in Italy, some were pursued, and others will be acted upon.

Two proposals were made for hosting the 2005 annual meeting. By a majority vote of the delegates, Porto, Portugal was selected as the site for the next meeting. Tentative dates are May 1-5, 2005. Prof. Susete Dias from Lisbon will be the host.

Several ideas were offered as topics for next year's one-day specialty symposium. Emerging technologies (biotechnology and nanotechnology) was selected as the focus.

This was followed by a meeting wrap-up discussion. We concluded that this was a highly successful meeting in which the delegates used their time effectively to learn from each other and create alliances to work together for the common goal of cleaner production and sustainability. We acknowledged many spin-offs that have occurred because of the pilot and many more that are in the making. The Pilot has fostered goodwill and understanding among delegates from different countries with diverse background and a spontaneous willingness to join in teams on selected projects. We decided that we should keep the CCMS country representatives abreast of the developments in this highly successful Pilot. We also pledged that we would provide mid-year progress reports for posting on the EPA website. The EPA portal would be populated with current information from the representative countries for all to share. This effort is lagging and would take our special attention.

Twenty seven countries were represented in the Budapest meeting (out of 31 members), making it the largest meeting so far. Delegates were present from the following countries: Belgium (new member), Bulgaria, Canada (new), Croatia (new), Czech Republic, Denmark, Egypt (new), Georgia (new), Germany, Greece, Hungary, Israel, Italy, Lithuania, Moldova, Norway, Poland, Portugal, Romania, Russia, Slovak Republic, Slovenia, Spain, Turkey, Ukraine, United Kingdom, United States.

Subhas K. Sikdar, Pilot Study Director  
Acting Associate Director for Health  
Sikdar.subhas@epa.gov

**NATO/CCMS Pilot Study on Clean Products and Processes - 2004 Annual Meeting**  
**Participants**

<b><u>Name</u></b>	<b><u>Affiliation</u></b>	<b><u>Country</u></b>
Dr. Carlo Vandecasteele*	University of Leuven	Belgium
Dr. Stefka Tepavitcharova	Bulgarian Academy of Science	Bulgaria
Dr. Alexander Omelchenko*	University of Manitoba	Canada
Dr. Ksenija Vitale*	University of Zagreb	Croatia
Col. Ales Komar	Military University	Czech Republic
Dr. Frantisek Bozek	Military University	Czech Republic
Associate Prof. Henrik Wenzel	Technical University of Denmark	Denmark
Dr. Kamal Ewida*	Zagazig University	Egypt
Mr. Zviad Tchumburidze*	Ministry of Defense	Georgia
Mrs. Khatuna Gogaladze*	Ministry of Environment	Georgia
Dr. Horst Pohle	Federal Environmental Agency	Germany
Dr. George Gallios	Aristotle University of Thessaloniki	Greece
Mr. Gyula Zilahy	Hungarian Cleaner Production Centre	Hungary
Prof. Chaim Forgacs	Ben-Gurion Univ of the Negev	Israel
Prof. David Wolf	Ben-Gurion University of the Negev	Israel
Dr. Alessandra Criscuoli	University of Calabria	Italy
Dr. Alberto Figoli	University of Calabria	Italy
Dr. Jurgis Staniskis	Kaunas University of Technology	Lithuania
Mr. Alexandru Strtulat	Advisor to the Prime Minister	Moldova
Dr. Annik Magerholm Fet	Norwegian University of Science and Technology - NTNU	Norway
Dr. Andrzej Doniec	Technical University of Lodz	Poland
Dr. Susete Dias	University of Lisbon	Portugal
Ms. Teresa M. Mata	University of Porto	Portugal
Dr. Antonio Martins	University of Porto	Portugal
Mr. Viorel Harceag	abc Consulting	Romania
Prof. Gueorgui G. Kagramanov	Moscow Mendeleev University of Chemical Technology of Russia	Russia
Miroslava Vaclavikova	Institute of Geotechnics of Slovak Academy of Sciences	Slovak Republic
Prof. Dr. Peter Glavic	University of Maribor	Slovenia

Prof. José Coca Prados	University of Oviedo	Spain
Prof. Aysel Atýmтай	Middle East Technical University	Turkey
Prof. William M. Zadorsky	Ukrainian State University of Chemical Engineering	Ukraine
Prof. Jim Swindall	QUILL Center, Queen's University	United Kingdom
Dr. Subhas K. Sikdar	U.S. Environmental Protection Agency	United States
Mr. Daniel J. Murray, Jr., P.E.	U.S. Environmental Protection Agency	United States
Prof. Farhang Shadman	University of Arizona	United States
Prof. D. Bhattacharya	University of Kentucky	United States
Dr. John Cihonski	Kreido Laboratories	United States
Dr. Thomas W. Chapman	National Science Foundation	United States
Dr. Gilbert Rochon	Purdue University	United States

\* New country representatives. Out of 31 countries that are members, 27 were present in the Budapest meeting.

#### **Other participants in the one-day symposium on Environmental Education**

Dr. Sandor Kerekes	Budapest University	Hungary
Dr. Laszlo Valko	Budapest Technical Univ	Hungary
Mr. Ronald Konrtar	Budapest University	Hungary
Dr. Zsuzsanna Szerenyi	Budapest University	Hungary
Prof. Akos Redey	University of Veszprem	Hungary
Dr. Gabor Onodi	Szent Istvan University	Hungary