



**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 5-9, 2007
University of Porto, Porto, Portugal**

Goals of Phase II of this Pilot:

- 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**

The 10th annual meeting of the NATO CCMS Pilot Study, Clean Products and Processes, was held in Porto, Portugal from May 5 to 9, 2007. Of the 31 countries involved in this pilot, 24 sent their representatives to this meeting. In addition Dr. Deniz Beten, Director of NATO SPS Program was in attendance. She delivered two talks featuring various vehicles of opportunities for delegates from NATO, partner countries, and Mediterranean dialogue countries to collaborate with one another on science and collective security issues. Following traditional practice, the delegates visited several industrial facilities to observe clean production techniques. These include: the cork manufacturer Amorim and Irmaos S.A., felt hat manufacturer, FEPSA – Feltros de Portugal, S.A., and two facilities of Simoldes Group, Simoldes Acos, the mould manufacturer, and Simoldes Plastocos, a plastic component producer. The meeting was mainly sponsored by NATO CCMS and US EPA. Additional local sponsor was the University of Porto. Typically one delegate per country attended this meeting. However, United States of America, Czech Republic, Belgium, Portugal, Italy, Israel, U.K., and Turkey each had more than one attendee at this meeting. The countries represented in this meeting were Turkey, USA, UK, Portugal, Slovenia, Belgium, Spain, Greece, Italy, Lithuania, Israel, Azerbaijan, Russia, Slovakia, Bulgaria, Czech Republic, Rumania, Moldova, Hungary, Canada, Poland, Norway, Denmark, and Croatia.

The meeting started at 6 pm on **Sunday evening (May 5)** with a reception, delegate introduction, and get-together. The opening session on **Monday morning (May 6)** was addressed by Prof. Marques dos Santos, Rector of the University of Porto, Subhas Sikdar, Director of this Pilot Project, Dr. Deniz Beten, Director of NATO SPS Program, and Mr. Daniel Murray, the Co-Director of the Pilot.

Here is the summary of the various activities:

Following the opening talks, the first technical session on **Monday started at 10 am**. This session was chaired by Daniel Murray. Monday's technical presentations were as follows:

- Aysel Atimtay (Turkey): 2006 Annual Meeting in Istanbul: Overview
- Jurgis Staniskis (Lithuania): Product life cycle design: Lithuanian case

- Jose Coca-Prados (Spain): Formulation, characterization and treatment of metalworking oil-in-water emulsions
- Alexander Omelchenko (Canada): Water-born environmental cardiovascular risk factors
- Chaim Forgacs (Israel): Wastewater treatment in industrial parks: The Ramat Chovav experience
- Andrzej Doniec (Poland): The problems of establishing symbiotic connections in industrial parks
- David Wolf (Israel): Incorporations and transfer of sustainable technologies in Israel
- Ksenija Vitale (Croatia): Sustainable environment through sustainable working conditions
- Annik Fet (Norway): Global production and corporate social responsibility
- Viorel Harceag (Rumania): Biofuels could be a solution on route to sustainable transport
- George Gallios (Greece) and Miroslava Vaclavikova (Slovak Republic): Removal of arsenic from water sources by a new synthetic resin
- Chantal Block (Belgium): Environmental performance indicators for industrial sites
- Peter Glavic (Slovenia): Sustainable development in higher education
- Alexandra Polzin (Portugal), Antonio Martins (Portugal), Teresa Mata (Portugal), and Subhas Sikdar (USA): Application of a sustainable metrics framework in a metallurgical company

From 4:00 to 5:30 pm a mini-workshop was organized and conducted by Subhas Sikdar on Indicators for sustainable development: definition and frameworks. This workshop is a follow-up to the ones held in Alesund and Istanbul in the previous two years. In this discussion various frameworks for sustainability metrics and indicators were presented by Adisa Azapagic, Annik Fet, and Peter Glavic. These were followed by discussion by the delegates.

Tuesday May 7 was devoted to the one-day topical symposium on Best Practices for Incorporation and Transfer of Sustainable Technologies in Industry. Typically we invite several guest speakers to augment talks delivered by the delegates. The session was chaired by Teresa Mata and Antonio Martins (Portugal). These are the talks delivered:

Topical Symposium: Best Practices for Incorporation and Transfer of Sustainable Technologies in Industry

The topical session was first by Subhas Sikdar, the Pilot Director and Prof. Alvaro Cunha of the Faculty of Engineering, University of Porto. This was followed by a keynote speech by Dr. Deniz Beten. She provided an elaborate description of various different ways NATO and partner country citizens can interact with one another using NATO SPS grant mechanisms. The other presentations were as follows:

- Jim Swindall (UK): Methods and best practices for technology transfer between university and companies
- F. Shadman (USA): Sustainability challenges and opportunities in nano-scale manufacturing
- Adisa Azapagic (UK): Transfer of sustainable technologies: examples from the UK
- Gilbert Rochon (USA): Establishing a shared spatial database of archival and real-time remotely sensed data for NATO countries and affiliates
- Henrik Wenzel (Denmark): Environmental assessment of 2nd generation bioethanol.
- Pedro Pacheco, Ruie Pedroto, and Rui Campos (Portugal): Organic pre-stressing (OPS) – a new sustainable construction technology
- Pedro Vieira (Portugal): Manufacturing a cylinder using a sustainable technology
- Knut Kappenberg (Portugal): Wood-based panels show their colors – forward-looking materials for sustainable impressions
- Francisco Araujo (Portugal): Industrialization of advanced optical technologies for environmental monitoring
- Joao Sousa and Gil Goncalves (Portugal): Unmanned vehicles for environmental data collection
- Joaquim Mendes (Portugal): New sensor for fouling measurement
- Closing speech by Jorge Goncalves, Vice-Rector of the University of Porto

Wednesday May 8 was scheduled for a field trip to visit three technical sites of interest to this Pilot. First we visited the manufacturing facility of cork manufacturer Amorim & Irmaos S.A. After a video presentation of the cork manufacture we were shown the manufacturing facility for natural cork stoppers for reserve wines and wines that need to age in the bottle. He also saw the facility for manufacturing granulated and agglomerated corks. After lunch we arrived at FEPSA –Feltros de Portugal S.A., the felt hat manufacturing company. This company makes hats from wool, rabbit and beaver fur. Lastly we visited two production units of Simoldes Group. Simoldes Acos manufactures moulds for automotive parts. Then we saw the production facility for plastic components for the automotive industry.

On Thursday May 9 several Pilot delegates presented results of their own research, as follows:

- Georgy Kagramanov (Russia): Use of membrane filtration methods for treatment of heavy metals containing wastewaters in combination with flotation
- Alessandra Criscuoli (Italy): Application of membrane contactors for treating polluted water
- Daniel Murray (USA): Sustainable water infrastructure in the U.S. Battling the aging process
- Carlo Vandecasteele (Belgium): Waste incinerators: source or sink of toxic POPs
- Thomas Chapman (USA): Applications for electrochemistry for clean processing
- Stefka Techavicharova (Bulgaria): Best practices for incorporation of sustainability in Bulgaria sea-salt industry
- Gyula Zilahy (Hungary): Support of sustainable production and consumption initiatives in Hungary

- S. Tepavicharova (Bulgaria): Thermodynamic modeling of inorganic chemical species in natural polluted waters
- Ales Komar and Franticek Bozek (Czech Republic): Implementation of BAT of sanitation of Relict Burdens
- F. Bozek (Czech Republic): Utilization of cleaner production and the best available technology in a food processing plant

The rest of the time on Thursday was devoted to choosing the location and host for next year's meeting and a wrap-up discussion conducted by Subhas Sikdar. We concluded that this was a highly successful meeting. We recognized 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.

For the 2007 meeting two proposals were offered: one from Greece (Thessaloniki) and the other from Germany (Berlin). My majority vote, we chose the offer from Greece by George Gallios. However at this writing, Greece, for unavoidable reasons, decided to rescind the offer, at which point Horst Pohle from Germany again offered to host the 2008 annual meeting in Berlin. The Berlin meeting has been scheduled from 4 to 9 May, 2008. This would be the concluding meeting of the Pilot project.

One note of sorrow from all the delegates of the Pilot. Dr. Kamal Ewida, the delegate from Egypt suddenly passed away last year. We fondly remembered him for his contribution to the meetings and his enthusiasm for the mission of the Pilot.

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**NATO/CCMS Pilot Study on Clean Products and Processes –
2007 Annual Meeting – Porto, Portugal, 5-9 May, 2007**

List of Participants

<u>Name</u>	<u>Affiliation</u>	<u>Country</u>
Dr. Vaqif Baghiyev	ELKO, Baku	Azerbaijan
Dr. Carlo Vandecasteele	University of Leuven	Belgium
Dr. Chantal Block	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
Dr. George Gallios	Aristotle University of Thessaloniki	Greece
Dr. Gyula Zilahy	Hungarian Cleaner Production Centre	Hungary
Prof. Chaim Forgacs	Ben-Gurion Univ of the Negev	Israel
Dr. Jurgis Staniskis	Kaunas University of Technology	Lithuania
Mr. Alexandru Strtulat	Advisor to the Prime Minister	Moldova
Dr. Andrzej Doniec	Technical University of Lodz	Poland
Dr. 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. Aysel Atýmтай	Middle East Technical University	Turkey
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
Dr. Gilbert Rochon	Purdue University	United States
Dr. Deniz Beten	NATO SPS	
Prof. J. Coca	Univ of Oviedo	Spain
Henrik Wenzel	Denmark Technological Univ	Denmark
Dr. Thomas Chapman	CIDETEQ, Queretaro	Mexico

Other participants in the one-day symposium on Water Recycle and Reuse

Dr. Adisa Azapagic	University of Manchester	U.K.
Prof. Alvaro Cunha	Univ of Porto	Portugal
Pedro Pacheco	Mota-Engil	Portugal
Rui Pedroso	Mota-Engil	Portugal
Rui Campos	Mota-Engil	Portugal

Pedro Viera	AMTROL-ALFA	Portugal
Knut Kappenberg	Sonae Industria	Portugal
Francisco Araujo	Fibersensing	Portugal
Joao Sousa	Univ of Porto	Portugal
Gil Goncalves	Univ of Porto	Portugal
Joachim Mendes	Univ of Porto	Portugal
Prof. Jorge Goncalves	Univ of Porto	Portugal
Alexandra Polzin	Univ of Porto	Portugal
Prof. Marques dos Santos	Univ of Porto	Portugal