AGENDA
MEC7
16-18 June 2010
DLCS, Strathclyde University, Glasgow, Scotland

DAY 1 - Wednesday 16th June

08.00 **Registration in the Colville Building, Strathclyde University**

09.00 Opening remarks and welcome on behalf of the sponsors/organisers:
Lesley Sloss; IEA CCC
Bob Kalin: DLCS, Strathclyde University

09.20 **SESSION 1: MERCURY LEGISLATION AND EMISSIONS**
Co-chaired by Peter Nelson and Helen Keenan

09.20 Update on US EPA position on mercury
Nick Hutson, US EPA

09:40 Status on mercury legislation and control in Nova Scotia (Canada)
Doug Campbell, Nova Scotia Power, Canada

10.00 Survey on mercury emissions from coal combustion boilers in China
Tsuyoshi Teramae, Idemitsu Kosan, Japan

10.20 **Coffee**

10.50 **SESSION 2: MERCURY MEASUREMENT**
Co-chaired by John Pavlish and Henk te Winkel

10.50 Analytical aspects of mercury emission, deposition and environmental contamination from the Polish perspective
Januzs Golas, AGH University of Science and Technology, Poland

11.10 Mercury in coal: geochemical aspects
Nikolay Mashyanov, Lumex Ltd and Nina Ozerova, IGEM, Russia

11.30 Analysis and cleaning technologies for mercury and other hazardous trace elements in coal (introduction of NEDO Project 2007-2010)
Akira Ohki, Kagoshima University, Japan

11.50 Experience with mercury field measurements using USEPA Reference Method 30b/30A
Joseph Siperstein, Ohio Lumex, USA

12.10 **Open forum and responses**

12.30 **Buffet lunch**

14.00 SESSION 3: MERCURY BEHAVIOUR AND CONTROL IN EXISTING PLANT CONFIGURATIONS
Co-chaired by Hiroshi Moritomi and Will Quick

14.00 Differential electrostatic precipitation behaviour and implications for mercury emissions control.
Herek Clack, Illinois University of Techology, USA

14:20 Oxidation, reemission and mass distribution of mercury in coal-fired power plants with SCR, CS-ESP and wet FGD
Yong-chil Seo and Deepak Pudasainee, Yonsei University, Korea

14.40 Catalytic oxidation of Hg0 in wet FGD by air and the fate of Hg2+ in the absorber solution
Andrej Stergarsek, Jozef Stefan Institute, Slovenia

15.00 Volatile trace elements of concern captured in fly ash particles and FGD in coal combustion power plant – mercury, boron and selenium
Shigeo Ito, CRIEPI, Japan

15.20 Questions and answers

15.40 Coffee

16.10 SESSION 4: MERCURY CONTROL - HALOGENS
Co-chaired by Nick Hutson and Andrej Stergarsek

16.10 Process chemistry of Br addition to utility flue gas for Hg emission and control
Stephen Niksa, Niksa Energy Associates, USA

16.30 Gas-phase mercury oxidation by halogens: effects of bromine and chlorine
Connie Senior, Reaction Engineering, USA

16.50 Native halogens in US coals and Chinese coals – low chlorine coals need bromide addition for effective mercury capture
Bernhard Vosteen, Vosteen Consulting GmbH, Germany

17.10 Open forum and discussion

17.30 END OF DAY 1

19.00 Reception with The Lord Provost of Glasgow at the Glasgow City Chambers

DAY 2 - Thursday 17th June

09.00	**UNEP WORKSHOP – COMBINED MEETING OF MEC7, UNEP COAL PARTNERSHIP AND UNEP FATE AND TRANSPORT PARTNERSHIP Co-chaired by Nicola Pirrone and Lesley Sloss**
09.00	F&T work and progress on the HTAP report *Nicola Pirrone, Italy*
09.20	Update on UNEP Hg work *Gunnar Futsaeter, UNEP Chemicals, Geneva*
09.40	Update on the UNEP Process Optimisation Guidance (POG) document *Wojchiek Jozewicz, Arcadis, USA*
10.10	Para 29 Study – report to the UNEP Governing Council *John Munthe, IVL, Sweden*
10.40	**Questions, answers and discussion of UNEP work**
11.00	**Coffee**
11.30	Development of an inventory for mercury emissions in Australia *Peter Nelson, Macquarrie University, Australia*
11.50	Update on the UNEP inventory and coal partnership work in China *Ye Wu, Tsinghua University, China*
12.10	Update on UNEP inventory work in South Africa *Greg Scott, DEAE, South Africa*
12:30	**Questions and answers**
12:40	**Buffet lunch**
13:15	*Discussion of Coal Partnership Business plan (optional for those interested/involved in the UNEP Coal Partnership)*
14:00	Update on UNEP inventory work in Russia *Alexander Romanov, SRI Atmosphere, Russia*
14:20	Report on Canadian projects Heather Morrison, Environment Canada, Canada
14.35	Report on USA Projects Nick Hutson, US EPA, USA
14.50	Report on Japanese projects Noriyuki Suzuki, NIES, Japan
15.05	Roundtable discussion
15:20	**Coffee**

15.50 Business plan update and responding to GC decision 25/5

16.50 Possible contribution of F&T to paragraph 29 study

17.20 Closing remarks for F&T meeting section

17:30 END OF DAY 2

18:50 Buses leave for Gala Dinner in The Auditorium at Oran Mor with live Ceilidh music

DAY 3 – Friday 18th June

09.00 SESSION 5: MERCURY CONTROL – SORBENTS
Co-chaired by Connie Senior and Steve Niksa

09.00 Micro-structure of MnO_2-$Ca(OH)_2$ composites and its mercury adsorption characteristics
Yufeng Duan, Southeast University, China

09.20 High temperature mineral-based sorbents for mercury- progress and problems
Jost Wendt, University of Utah, USA

09.40 Large-scale demonstrations of mercury capture by adding powdered activated carbon to the WFGD and bromide to the coal at a power plant in Germany
Thomas Riethmann, Evonik Energy Services GmbH, Germany

10.00 Advanced AQCS for controlling mercury
Hirofumi Kikkawa, Kure Research Lab, Babcock-Hitachi KK, Japan

10.20 Experimental study on mercury removal by non-carbon sorbents
Yuqun Zhuo, Tsinghua University, China

10.40 Coffee

11.10 SESSION 6: MERCURY CONTROL IN ALTERNATIVE SYSTEMS
Co-chaired by David Fitzgerald and Harald Thorwarth

11.10 Advances in activated carbon for mercury removal from coal-fired power plants and cement kilns
Sharon McGee and Wolfgang Hardtke, Albemarle Corp, USA & Germany

11:30 Mercury in oxyfuel combustion
Stanley Santos, IEA GHG, UK

11:50 Mercury measurement and control in a CO_2-enriched flue gas

John Pavlish, EERC, USA

12.10 Discussion

12.30 Meeting Closure

12.30 Buffet lunch for those not going on the site visit

12.45 Bus leaves for Plant Tour of Doosan Babcock Oxyfuel combustion lab, including buffet lunch on site

16.30 Return to hotel (time approximate and very dependant on traffic)

IEA Clean Coal Centre supports its member's efforts to make the production, transportation and use of coal sustainable. The Centre provides this support by providing a unique global resource that the members can reliably draw upon for credible and unbiased information and expertise on all aspects of the sustainable use of coal. Services are delivered to members through reports and reviews on important topics, advisory services to governments and industry, support for relevant R & D, and by providing networking opportunities that foster international co-operation within and amongst developed and developing countries.
IEA Clean Coal Centre is a collaborative project established in 1975 involving member countries of the International Energy Agency (IEA). The service is governed by representatives of member countries, the European Commission, and industrial sponsors. The IEA Clean Coal Centre programme of work contains studies of considerable significance for all countries involved in the use or supply of coal.

The IEA was established in 1974 within the framework of the Organisation for Economic Co-operation and Development (OECD). A basic aim of the IEA is to foster co-operation among the twenty-four IEA participating countries in order to increase energy security through diversification of energy supply, cleaner and more efficient use of energy, and energy conservation. This is achieved, in part, through a programme of collaborative research and development of which IEA Clean Coal Centre is by far the largest and the longest established single project

www.iea-coal.org.uk

MEC was established by the CCC back in 2003 and has gone from strength to strength. Papers from the previous MEC meetins are available on the CCC website

http://www.iea-coal.org.uk/site/ieacoal/publications/mec6?

A user name and password is required for this :

Username: expert1

Password: MEC5#2008

Papers from MEC7 will be also be made available from the IEA CCC website following the meeting in Glasgow.

Agenda for F&T meeting section
17th June, 2010

Meeting Objectives

(1) Update the members and discuss the status of current and future partnership activities
(2) Explore possible linkages with Coal Combustion Partnership
(3) Identify and discuss issues in terms of overall direction and coordination of the F&T Partnership
(4) Develop an updated F&T Partnership Business Plan

Agenda:

1 Roundtable of F&T partners to share their perspectives on directions and coordination of the Partnership; suggestions on possible future activities (either new or continued activities) of the F&T partnership.

2 Business plan update and responding to GC decision 25/5

How can F&T update its 2008 business plan taking into account the observations and recommendations made by the Partnership Advisory Group (PAG) at the first meeting held in Geneva (31 March - 2 April 2009). The following items derive from observations made by the PAG with the aim of encouraging the work of the partnership areas consistent with the overall goal and operational guidelines of the UNEP Global Mercury Partnership.

- How can F&T improve the linkages with other air-emissions-related partnership areas?
- How can F&T communicate and coordinate activities with other partnership areas?
- How can F&T describe more clearly in its business plan the linkages with other air-emissions-related partnership areas?
- How can F&T provide information that might assist the intergovernmental negotiating committee in prioritizing the sources of mercury releases for action (see paragraph 28e of decision 25/5)?
- Could F&T contribute to the study pursuant to paragraph 29 of decision 25/5 with respect to the analysis and assessment of the cost and effectiveness of alternative control technologies and measures?
- How can F&T promote capacity building activities?
- How can F&T develop additional activities that would be aimed to identify gaps in emission inventories (e.g., non-point sources, natural emissions)?

3 Possible contribution of F&T to paragraph 29 study

- Partners providing any available information on costs and effectiveness of alternative control technologies and measures;
- Review of a "zero draft";
- Any other possible contribution.

Maps and logistics

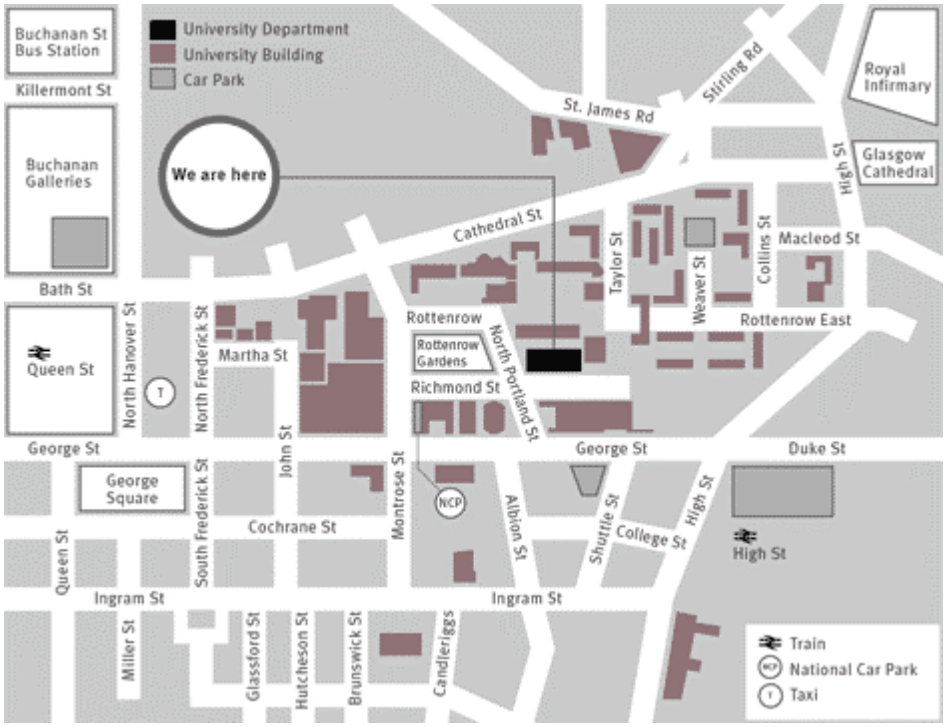
Both the university and the Premier Inn are located on or close to George Street, which is very central in Glasgow. George Street is only 10 miles from Glasgow airport but, depending on the time of day and the level of traffic, a taxi may take anywhere between 15 minutes and 40 minutes to complete the journey. George Street is also central for Queen Street Railway Station and Buchanan Street Bus Station as well as the Buchanan Galleries and related shopping areas.

Most delegates will be staying at the Premier Inn which is directly opposite the Colville building on George Street. Signs will be posted on the doors to the Strathclyde University building to direct MEC delegates to the registration desk, meeting room and exhibition area,

MEC7 will be held in the Colville Building, Rooms 5.11 and 5.12. Entrance is by stairs from Level 4. Do not take the lift to Level 5, you WILL get lost.

From Premier Inn, cross the road towards the Royal Bank of Scotland. Turn right and travel one block east along George St. (away from George Square). At North Portland St turn left, up the hill. Cross the road (Richmond St) towards the tall white building with stairs beside the street. The entrance to Colville building is half way up the hill. Take the lift to level 4, go straight ahead through fire doors and along the corridor. At the end of the corridor you will find an open area with doors to 5.11/5.12. Go through the doors and up the stairs to the registration area.

Signs will be posted from the corner of North Portland St and Richmond St.



Reception Wednesday 16th June, City Chambers

The reception on Wednesday night will be held at the **Glasgow City Chambers,** which is on George Square, a short walk along George Street and a left turn into the central square, only a few hundred yards from the Colville Building and the Premier Inn.

http://www.rampantscotland.com/visit/blvisit_chambers.htm

The reception will commence promptly at 19:00 on the Wednesday evening and should last no longer than 2 hours. This will involve a drinks reception and some canapés. Although the dress code is not formal, we would request that delegates dress smartly for this prestigious event.

Gala Dinner, Thursday 17th June

The MEC7 gala dinner will be held at the wonderful Oran Mor, a converted church near the Glasgow Botanical Gardens.

Delegates will be transported to Oran Mor by bus. The buses will leave from George Street, just in front of the Strathclyde building and opposite the Premier Inn, promptly at 18:50. We urge all delegates to be on board well on time to ensure the smooth timing for the rest of the evening. Should anyone miss the bus, a taxi will be able to get you there within 10-15 minutes.

The dress code for the evening is smart/casual. There will be an opportunity for some Scottish dancing to our very special ceilidh band so please wear appropriate shoes if you wish to take part.

Buses will leave to return to the Premier Inn at 23:00, although the renowned Whisky Bar at Oran Mor will remain open much later should anyone wish to stay on and make their own way home. http://www.oran-mor.co.uk/page/The_Whisky_Bar_152.html

Site visit to Doosan Babcock, Friday 18th June

Buses will leave to take delegates to the site visit from George Street at **12.45** prompt. Lunch will be provided at Doosan so please **DO NOT** eat the buffet provided for the other delegates!

The journey to the site should take less than 30 minutes, depending on traffic. For those of you who may be flying home on Friday night, please note that the Doosan Site is only 3 miles from the airport.

http://www.doosanbabcock.com/live/cme362.htm

Following the tour, the buses will aim to get you back to George Street/Premier Inn before 18:00 but please note that Glasgow rush hour traffic can be particularly bad on a Friday evening.

Other important information

If you have any problems or need personal help, please feel free to phone Lesley Sloss on +44 (0) 77 11 33 5999. Any queries on the exhibition should be directed to Janey Andrews on +44 (0) 77 12 52 6636.

And now a word from our sponsors!

MEC and its delegates would like to thank all this year's sponsors for making this meeting possible. There are few, if any, meetings left these days where specialists can meet in relative privacy to discuss issues at a comfortable but challenging level without paying an exorbitant fee. Further, the sponsorship allows us to organise the social events that make MEC special.

Please take time during MEC7 to visit the exhibitors and chat and to seek out the sponsors to thank them personally for their contribution to the meeting.

Air Monitors Ltd

Air Monitors Ltd specialise in the sales, service and technical support of instrumentation to measure and detect gases, and to monitor and sample particles, in ambient air, process streams and in the workplace.

AML provides exclusive UK distribution for the Air Quality Instruments business unit of Thermo Fisher Scientific, a major world-wide supplier of analysers and systems to monitor gases and particulate matter in ambient air, source emissions and in occupational/ environmental hygiene applications.

The Thermo Scientific Mercury Freedom System offers an integrated solution to the measurement of elemental, ionic and total mercury in exhaust stacks from both coal-fired boilers and waste incinerators.

The system includes a probe incorporating an innovative dry converter and $HgCl_2$ generator, plus three separate instruments, a probe controller, a mercury analyzer (using advanced cold vapour atomic fluorescence) and an elemental calibrator, fully integrated into a single EIA rack.

Representatives of Thermo Fisher Scientific and Air Monitors will be available to discuss your application, and the Mercury Freedom Systems at MEC7.

www.airmonitors.co.uk
www.thermoscientific.com

Ablemarle

Albemarle | Sorbent Technolgies is a full service mercury solutions division of Albemarle Corporation (NYSE: ALB) that pioneered Brominated Powdered Activated Carbons (PAC) and has the broadest selection of mercury sorbents to meet the unique needs of each utility. Albemarle Corporation's mercury sorbents include: B-PAC™ (Maximum Performance Sorbent), C-PAC™ (Concrete-Friendly™ Sorbent), H-PAC™ (High Temperature Sorbent), FF-PAC™, specially designed for fabric filters, and Bromine Derivatives (including Mercury Control Calcium Bromide and Hydrobromic Acid) for boiler and duct injection. Albemarle also provides performance guaranteed Activated Carbon Injection Systems for large and small utility and industrial boilers, and has a mobile demonstration unit for full-scale testing.

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ARCADIS is an international company providing consultancy, design, engineering and management services in infrastructure, water, environment and buildings. We enhance mobility, sustainability and quality of life by creating balance in the built and natural environment. ARCADIS develops, designs, implements, maintains and operates projects for companies and governments. With 15,000 employees and $2.4 billion in revenues, the company has an extensive international network supported by strong local market positions. U.S. Stats: 200 offices, 6,000 employees. Global Stats: 15,000 employees, Over 300 offices.

PS Analytical Ltd

P S Analytical Ltd is a world leading manufacturer of laboratory, online and process mercury analysers. The core of our technology is based on atomic fluorescence spectrometry. This approach offers highly accurate measurements with superior detection limits and a wide linear dynamic range.

Complete Hg CEM systems are available including sampling probes, conditioning equipment, multi-stream measurement and online calibration. Speciation measurements can also be provided. Systems can be applied to a wide range of applications, such as stack gas, workroom air, ambient air, natural gas, syngas and wastewater. With over 25 years of specialist experience and a dynamic application support group we have developed instrumentation specifically designed to meet the needs of the Petrochemical, Chemical and Environmental markets.

For further information contact P S Analytical, Orpington, Kent. Tel: (01689) 891211
E-mail: psa@psanalytical.com

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Lumex Ltd. is a manufacturer of wide range of analytical equipment including unique Zeeman AAS mercury spectrometers. A multifunctional RA-915+/M analyser is used in hundreds laboratories worldwide. In power industry the RA-915+/M analyser provides fast, precise mercury analysis in solid, liquid, and gaseous fuels, stack gases, liquid and solid wastes, indoor and outdoor air.

A new series of on-line mercury monitors RA-915AM/NG/FG was developed for environmental and industrial applications.

With high quality of our instruments and excellent expertise of our engineers, Lumex has become the worldwide supplier of solutions for research, industry and environmental organisations and labs.

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ICL Industrial Products (ICL-IP)

ICL Industrial Products is the industrial chemicals arm of ICL, a major chemical company active in the global markets of performance and specialty chemicals, fertilizers and metallurgy.

ICL-IP is divided into 7 business units: Flame Retardants (FR); Brominated Inorganic Products (BIP); Agrochemicals (AGR); Biocides (BIO); Magnesia Products (MGP); Dead Sea Salts (DSS) and IMI.

ICL-IP draws on the vast resources of the Dead Sea, one of the world's largest resources of bromine, magnesia and potassium salts.

ICL-IP supplies more than a third of the global demand for bromine. The company's economies of scale are unmatched in the industry; its plant in Sdom is the world's largest bromine plant, and is back-integrated to chlorine (bromine production main raw material).

ICL-IP's chlorine supply is based on chlorine produced by ICL's magnesium metal production, whose chlorine byproduct is used for the production of bromine. ICL-IP's chlorine supply is backed by its own dedicated chlorine plants.

In addition to its bromine based activities, ICL-IP also produces magnesia and chlorine based salts, and a range of products based on phosphorous chemistries.

ICL-IP services a wide range of industries such as plastics and polymers, electronics, water-treatment, oil-drilling and housing. Its products are used as flame retardants, food additives, intermediates for the pharmaceutical and cosmetic industries, soil and space fumigation, functional fluids, paints and dyes and photographic materials.

Linde

The HiQ® specialty gases product range from Linde supplies high purity gases, gas mixtures, precision engineered equipment and gas distribution systems, and services and support, to a wide range of industries employing specialty gases applications. It encompasses, but is not limited to, SPECTRA environmental including NIST traceable mercury standards and rare gases products, REDLINE® specialty gases equipment and BASELINE® specialty gases regulators, , ECOCYL® portable specialty gases solutions and VERISEQ® pharmaceutical grade gases. HiQ® represents Linde's commitment to the highest available quality and global consistency across gases, equipment and services.

To learn more, go to http://hiq.linde-gas.com

The Linde Gases Division, part of the Linde Group, is a leader in the international industrial and healthcare gases markets, providing compressed, bulk, specialty and medical gases, as well as chemicals to virtually all fields of industry globally. The company adds value to its customers' businesses through the provision of state-of-the-art application technology, process know-how, services and equipment.

The Linde Group is a world leading gases and engineering company with almost 48,000 employees working in more than 100 countries worldwide. In the 2009 financial year it achieved sales of EUR 11.2 billion. The strategy of The Linde Group is geared towards sustainable earnings-based growth and focuses on the expansion of its international business with forward-looking products and services.

For more information, see The Linde Group online at http://www.linde.com

Chemtura Corporation

Chemtura Corporation, with 2008 sales of $3.5 billion, was formed in 2005 with the merger of Crompton Corporation and Great Lakes Chemical Corporation. Our history – which includes Crompton & Knowles Corporation, Uniroyal Chemical Corporation and Witco Corporation – reflects more than 100 years of growth and innovation. Chemtura has more than 4,000 employees in research, manufacturing, sales and administrative facilities in every major market of the world. We are a leading global supplier of plastic additives, including flame retardants; a leading manufacturer of pool and spa products; a global leader in seed treatment and miticides in the agricultural market; the largest component supplier to the lubricants industry; and a top global producer of hot cast urethane pre-polymers. At Chemtura, our focus is on excellence in everything we do, and performance improvement is our mission.

Vosteen Consulting

Vosteen Consulting is experienced in process analysis at industrial plants (waste combustion, sewage sludge combustion, toxic waste water combustion and coal combustion), aiming at process optimization as capacity heightening (e.g. by oxygen enrichment), and emission minimization/effective emission control. Vosteen Consulting owns IP-rights on its proprietary mercury abatement from flue gases, based on bromide addition to the combustible feed prior to or during combustion. The technology - as invented by Prof. Vosteen 10 years ago and first presented at AQ IV in Arlington (2003) and also at MEC 3 in Ottawa (2004) - has been licensed and sub-licensed to many companies in North America

and Europe (e.g. ALSTOM Power, Southern Company, US EPRI, WE Energies or AE&E, EGLV Waste Water Treatment Bottrop, Town Karlsruhe Waste Water Treatment Neureuth). Vosteen Consulting is co-operating with EVONIK Energy Services on two demonstration projects at PC-fired boilers of EVONIK sites in Germany.