THE UN ENVIRONMENT COAL PARTNERSHIP

BEST PRACTICE OPTIONS AND PROJECTS IN EMERGING ECONOMIES

LESLEY SLOSS

COP2, GENEVA, NOVEMBER 2018

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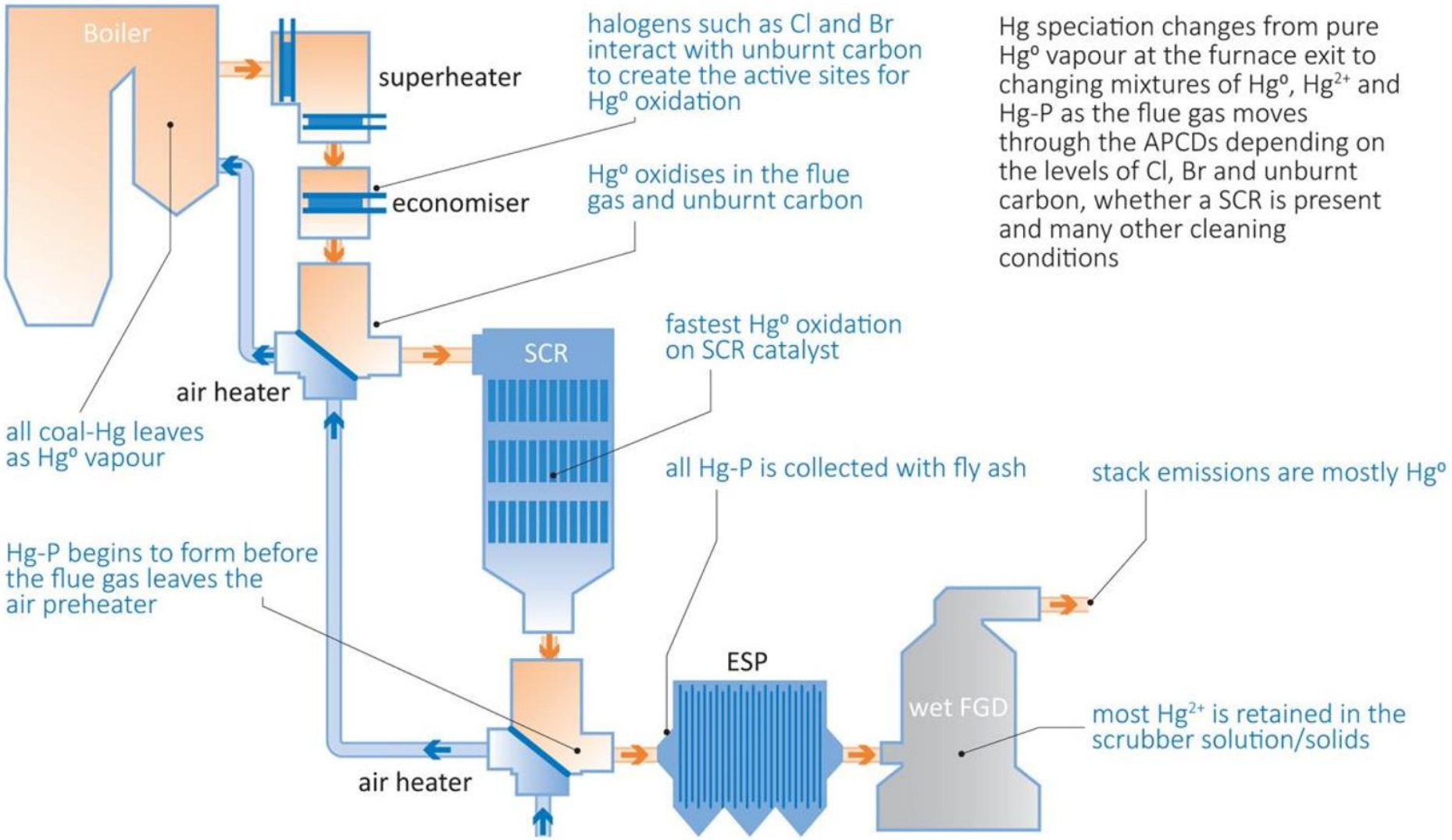
MERCURY BEHAVIOUR IS COMPLEX



Hg speciation changes from pure Hg^0 vapour at the furnace exit to changing mixtures of Hg^0, Hg^{2+} and Hg-P as the flue gas moves through the APCDs depending on the levels of Cl, Br and unburnt carbon, whether a SCR is present and many other cleaning conditions

MERCURY REDUCTION OPTIONS IN THE BAT/BEP GUIDANCE

Pre-combustion Hg reduction options for coal

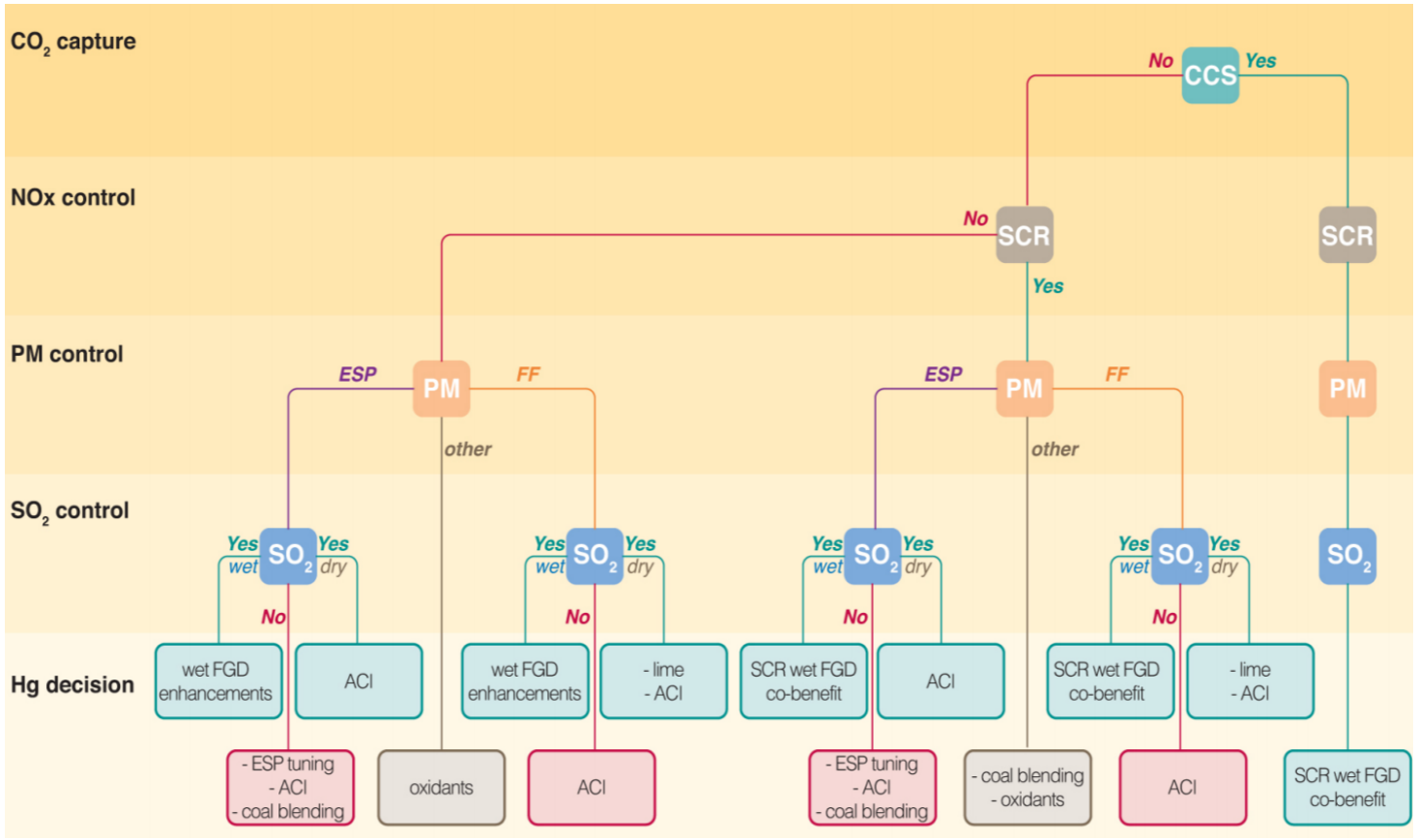
- select
- blend
- wash

Co-benefit – use systems you already have in place

- particulate (dust) control systems
- flue gas desulfurization technologies
- oxidation

Hg-specific control technologies

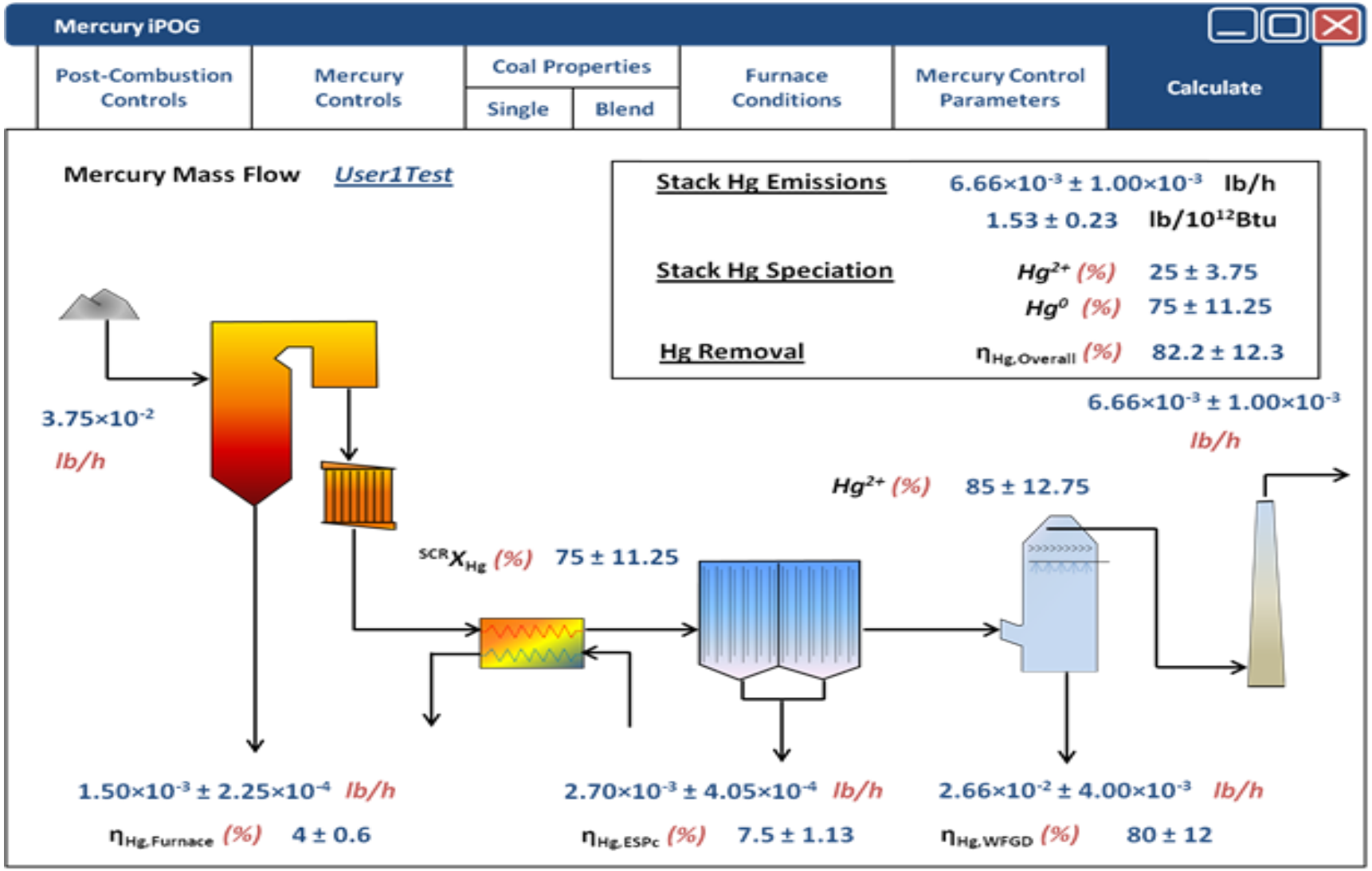
- Activated carbon injection (ACI)
- Other advanced technologies



FLOW CHART OF MERCURY CONTROL OPTIONS

An easy chart which allows the user to work through BAT/BEP (best available technology/best environmental practice) to choose an option which will work best at a specific plant

PREDICTING EMISSIONS AND CONTROL OPTIONS: THE IPOG



Screenshot of iPOG system

COST COMPARISON OF CONTROL OPTIONS

Table 4 Relative cost of Hg removal for various techniques			
Approach	**Capital cost**	**Incremental O&M cost**	**Comments**
Increasing plant efficiency	moderate	low	Not a significant effect on mercury emissions but good for multi-pollutant emission plant output
Coal washing/treatment	High	moderate	Washing is less expensive than chemical treatment. Coal specific results
Coal blending	Very low	Very low	Will depend on coal availability. May require refurbishment of pulverisers
Coal additives	Very low	low	Can be sprayed on to coal or into boiler. Proprietary, so cost varies with supplier. May be issues with corrosive impacts on plant
Upgrading flue gas controls (ESP, FF, FGD)	variable	low	The cost of upgrading on modifying existing pollution control devices will vary on a case by case basis but could improve performance of the plant in more than just mercury control and is a one-off cost
Activated carbon injection	Low	low	Maintenance of new sorbent injection facility now required. High costs for waste management for some sorbents. However, newer sorbents are low cost and do not cost disposal issues
Multi-pollutant systems	New, therefore variable	variable	New systems are emerging into the market and need to be considered on a case by case basis

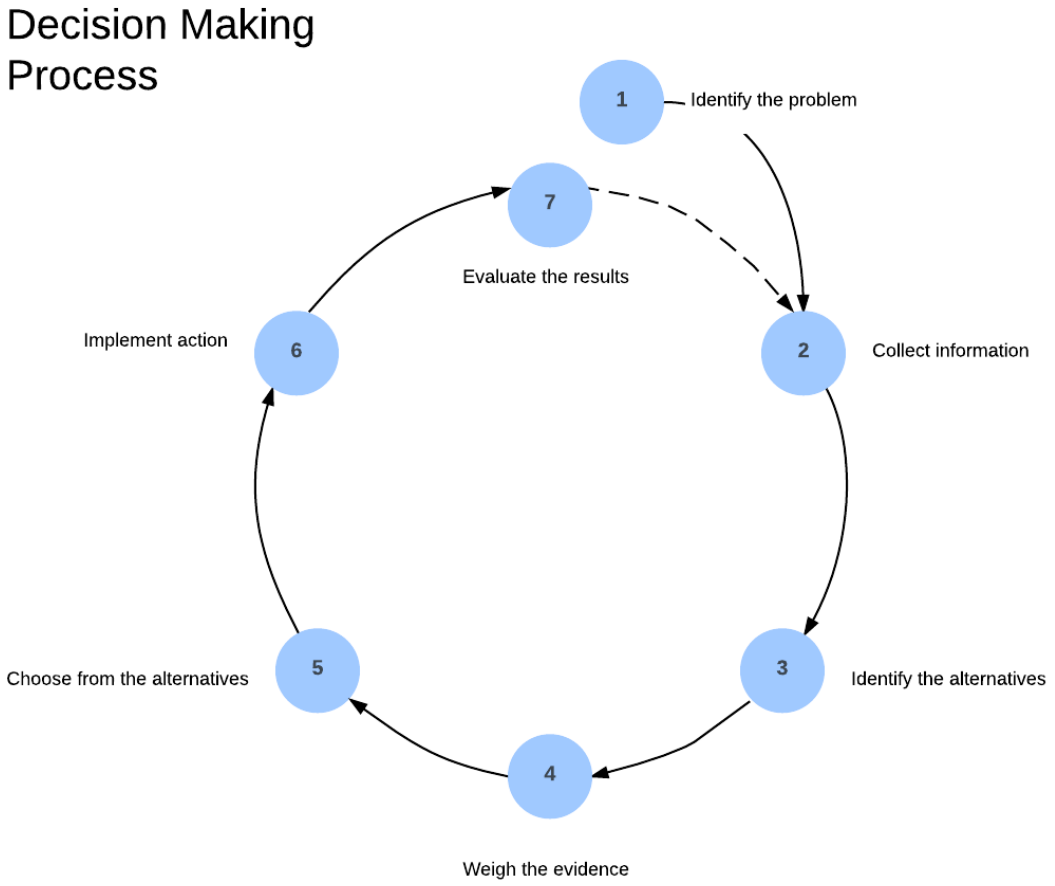
From Sloss, 2015

RETROFITTING TIMESCALES

Emission Control Device	Primary Pollutant Controlled	Co-benefit Reductions	Installation Times* (design to completion)	Outage Times*
Fabric Filter (full or polishing)	Particulate Matter/Non Hg Metals	Mercury (with or without ACI), Acid Gases, with DSI	12 to 24 months	1 - 4 weeks **
ESP Upgrade	Particulate Matter/Non Hg Metals	Mercury – with ACI, Acid Gases, with DSI	6 to 24 months	0 to 4 weeks
Dry Sorbent Injection (DSI)	Acid Gases	SO_2, SO_3, SeO_2	9 to 12 months	None
Dry Scrubber	Acid Gases	SO_2, SO_3, SeO_2, Hg	24 to 36 months	1 – 4 weeks
Scrubber Upgrades	Acid Gases	SO_2, SeO_2, Hg	12 to 36 months	4 to 8 weeks (in two parts)
Activated Carbon Injection (ACI)	Hg	-	12 to 18 months	None

DECISION PROCESS FOR THE PLANT OPERATOR

- Do I need to install controls?
- … really?
- How soon?
- Who is paying for it?
- Which is the best system for my coal?
- Will it actually work on my plant?
- How do I make an informed choice?
- Where do I make my purchase?



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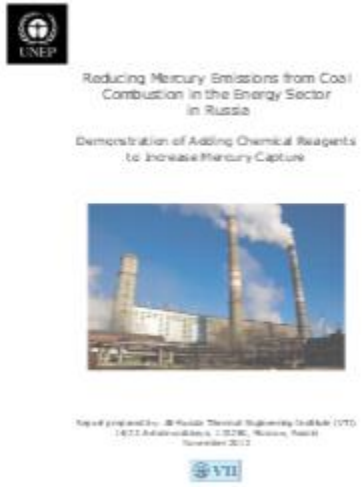
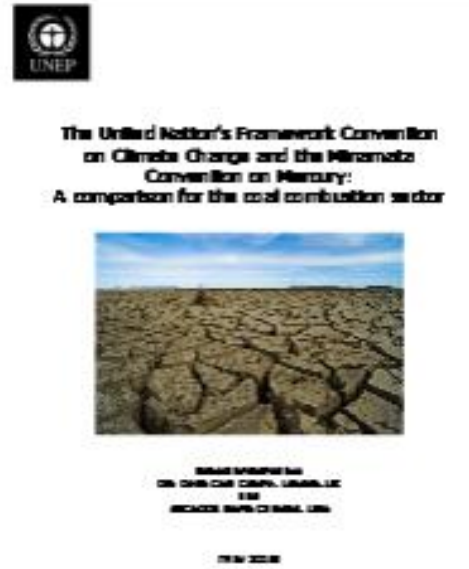
Mercury control from coal combustion

COMPLETED INVENTORY AND DEMONSTRATION PROJECTS

- China
- Russia
- India
- South Africa
- Thailand
- Vietnam
- Indonesia





WEBINAR

THE MINAMATA CONVENTION: WHAT DOES IT MEAN FOR COAL?

25th October 2017 Lesley Sloss

ABOUT THIS WEBINAR

This timely webinar will review the implications of the Minamata Convention on Mercury on coal. COP1, the 1st Conference of the Parties, of the convention was held in Geneva at the end of September. Tune in to to get a full update on the final text of the Minamata Convention on Mercury and a discussion on the potential consequences for emerging economies who have a significant dependence on coal.

UNEP (the United Nations Environment Programme) first raised the issue of mercury as the most important, unregulated, pollutant in the global environment in the mid 2000s and, in response,

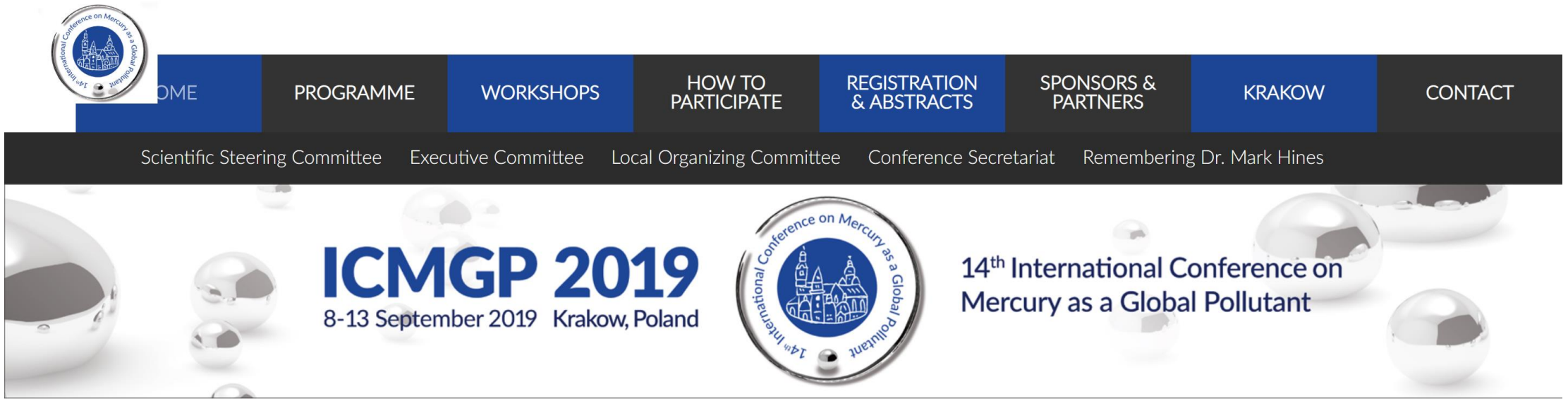
DR LESLEY SLOSS

Dr Lesley Sloss has produced reports and run workshops and conferences for the CCC for more than 20 years. Lesley's areas of expertise include emissions and

ICMGP 2019 KRAKOW

The Coal Partnership will be:

- giving a plenary at the conference
- acting on the organising committee to select papers, exhibitors and sponsors
- running a one-day “training course” on mercury monitoring and control



TRAINING COURSE

- Requested by Servicio Geologicao Colombiano (Geological Survey of Colombia
- 2 day course on mercury monitoring and control
- Site visit to Paipa
- Running iPOG simulation on real plant data

MEC14 VIETNAM

- Support from Vietnamese Environment Administration
- Expect >80 delegates from 25 countries
- Oct/Nov 2019
- All papers freely available after the event

https://www.scmp.com/week-asia/business/article/2053399/why-climate-conscious-vietnam-choosing-coal-over-nuclear

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COAL PARTNERSHIP CONTINUES TO GROW AND EVOLVE

POTENTIAL FUTURE WORK

- Assistance to national implementation plans
- Further inventory work and demonstration projects
- Continued outreach at international events
- Updating the BAT/BEP and the iPOG – creating an easier user interface

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