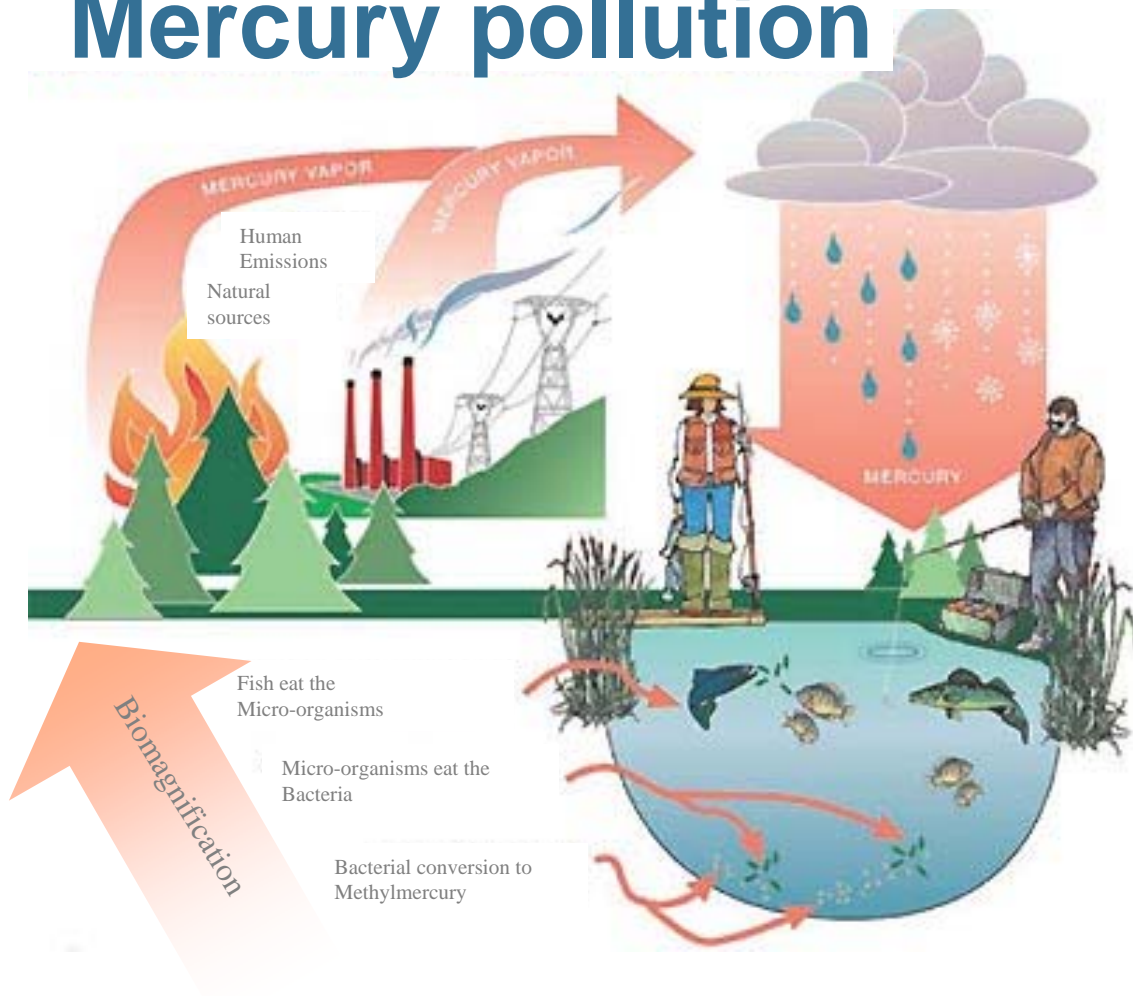


Mercury abatement within the Crematoria sector

Dr Colin Gillespie
Scottish Environment Protection Agency

Mercury pollution





OSPAR Convention for the Protection of Marine Environment of the North-East Atlantic

OSPAR Recommendation – controlling the dispersal of Mercury from Crematoria

- Promote the application of BAT to prevent the dispersal of mercury into the environment, especially from dental amalgam
- The level of technique applied is dependent on the size, construction, economic feasibility, location and age of the crematorium
- Both cultural and societal impacts associated with cremation should be taken into consideration in controlling pollution from this sector

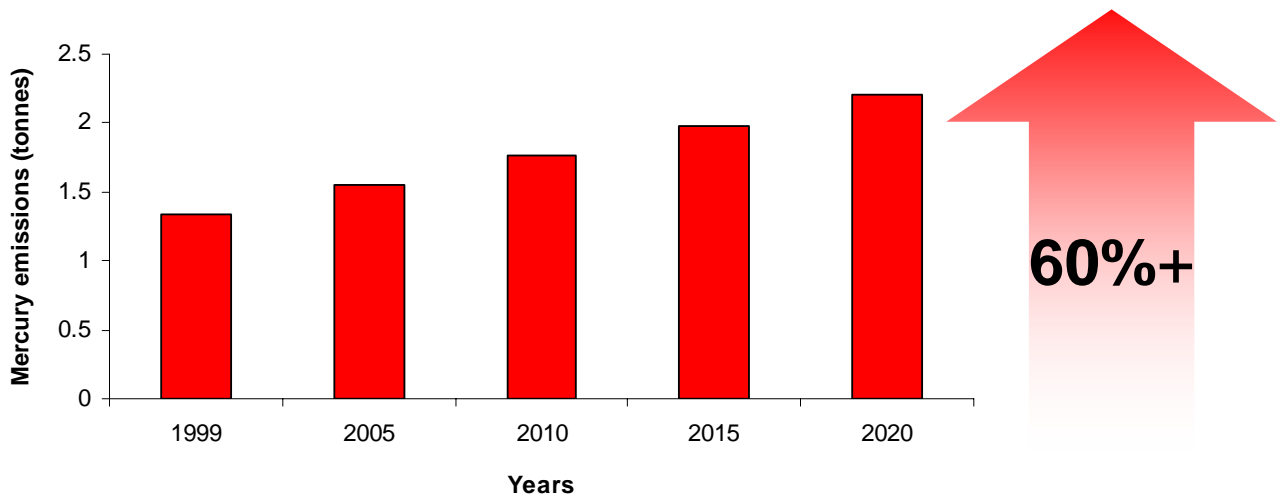
Projected emissions of Mercury in the UK

	Crematoria	Primary lead/zinc	Coal/Coke: Power	Coal: industry, nonindustrial + domestic	Chloralkali	Clinical Waste Incineration	Other*	Total	named sources (ie excl 'other') as percentage of total	Crematoria as percentage of total
1999	1.34	0.29	1.56	1.42	1.41	0.37	2.16	8.55	75%	15.7%
2005	1.55	0.29	1.36	1.25	1.41	0.12	2.16	8.14	73%	19.0%
2010	1.77	0.29	1.16	1.07	0.00	0.12	2.16	6.57	67%	26.9%
2015	1.98	0.29	0.96	0.89	0.00	0.12	2.16	6.40	66%	30.9%
2020	2.20	0.29	0.76	0.71	0.00	0.12	2.16	6.24	65%	35.3%

Data Source: Mercury emissions from crematoria, Consultation on an assessment by the EA's LAU

- **Majority of emissions from individual sectors is steadily decreasing**
- **Crematorium emissions are steadily increasing**
- **By 2020 projected emissions from crematoria could account for over 30%**

Projected emissions of Mercury from the crematoria sector



Data Source; Mercury emissions from crematoria, Consultation on an assessment by the EA's LAU

- **Emissions are predicted to steadily increased over 60% by 2020, plateau to 2035, followed by a reduction reaching 2000 levels by 2055**

Projected emissions linked to dental hygiene

age	Percentage of adults with no teeth		
	1978	1988	1998
16-24			
25-34	4	1	
35-44	13	4	1
45-54	32	17	6
55-64	56	37	20
65-74	79	57	36
Over 75		80	58

age	Number of sound restorations in adults		
	1978	1988	1998
16-24	8	5.5	2.9
25-34	9.8	10	7.4
35-44	8.9	11.1	10.1
45-54	7.1	9.6	11.1
55-64		7.1	9
65-74	4.8	5.7	8.2
Over 75		3.7	6.5

Data Source; Mercury emissions from crematoria, Consultation on an assessment by the EA's LAU

- **More adults are retaining their teeth**
- **With dental restoration using amalgams higher in adults aged 45-54**
- **Emissions are therefore predicted to rise and plateau before dropping back down.**

Defra Consultation; Mercury emissions from crematoria



Responses from the
: achieved without

- Many of the newer crematoria can accommodate the abatement
- Older crematoria can have structural constraints or heritage considerations
- FBCA reported a potential 23% closure, however this is more in the region of 15%



Defra Consultation; Mercury emissions from crematoria

Conclusions drawn through responses from the consultations were as follows:

- Reductions should aim to be achieved without crematoria closures
- **Develop a fair reduction mechanism for a proportion of existing crematoria**

CREMATORIA
ABATEMENT OF
MERCURY
EMISSIONS
ORGANISATION

- **Burden sharing scheme where all members pay per cremation, then receive payment per abatement**
- **Industrial targets;**
2008 10% of cremations abated
2010 20% of cremations abated
2012 50% of cremations abated

Defra Consultation; Mercury emissions from crematoria

Conclusions drawn through responses from the consultations were as follows:

Monitoring date	Indicative benchmark (proportion of cremations subject to upgrade in order to achieve the overall 50% mercury reduction*)
31 December 2006	-
31 December 2007	10%
31 December 2008	20%
31 December 2009	40%
31 December 2010	60%
31 December 2011	80%
31 December 2012	100%

*% of the cremations required to achieve the 50% reduction target

- **Spread the reduction programme for existing crematoria over a number of years**
 - Data is collected within the sector and reported against to Defra and the devolved administration
 - If the target is not being achieved then further legislation will be put in place

Defra Consultation; Mercury emissions from crematoria

Conclusions drawn through responses from the consultations were as follows:

- Reductions should aim to be achieved without crematoria closures
- Develop a fair reduction mechanism for a proportion of existing crematoria
- Spread the reduction programme for existing crematoria over a number of years
- **New crematoria should be required to install mercury abatement**

All new crematorium will fit mercury abatement at either;

- a) 12 months before more than 750 cremations, or**
- b) 31 December 2012**

Defra Consultation; Mercury emissions from crematoria

Conclusions drawn through responses from the consultations were as follows:

- Reductions should aim to be achieved without crematoria closures
- Develop a fair reduction mechanism for a proportion of existing crematoria
- Spread the reduction programme for existing crematoria over a number of years
- New crematoria should be required to install mercury abatement
- **The requirement to remove teeth prior to cremation was not acceptable**

The main aims of the UK's regulatory approach

- **Implement a mercury reduction programme before expected increases in mercury emissions**
- **Reduce mercury emissions through abating 50% cremations across the UK in order to reduce the risk of potential closures**
- **Implement a form of self control for the industry through the setup of an industry-based burden sharing scheme**
- **The burden sharing scheme will be used to phase in the abatement process for the target date 2012**
- **All new crematoria (above the 750 threshold) will be required to fit abatement**

Scotland's abatement target for 2012

Premises	Throughput (2003)
Maryhill Crematorium	1723
Woodside Crematorium	1530
Inverclyde Crematorium	1042
Linn Crematorium	2626
Craigton Crematorium	1056
Cardross Crematorium	557
Clydebank Crematorium	1797
Daldowie Crematoria	4305
Masonhill Crematorium	1608
Holmsford Bridge Crematorium	1110
North Lanarkshire Crematorium	1007
Roucan Loch Crematorium	624
Sydes Brae Crematorium	780
Aberdeen Crematorium	2490
The Nurseries Crematorium	370
Inverness Crematorium	669
Camelon Cemetery	2319
Mortonhall Crematorium	2943
Warriston Crematorium	2293
Seafield Crematorium	819
Dundee Crematorium	1729
Parkgrove Crematorium	644
Kirkcaldy Crematorium	1775
Dunfermline Crematorium	798
Perth Crematorium	1144
Total cremations	37758
Total abated cremations	20712
% adatement achieved	55

- **Scotland currently performed 37,758 cremations in 2003, UK total was 442,538 cremations**
- **Scotland aims to achieve 20712 abated cremations**
- **Scotland will aim to achieve 55% abatement, whilst the UK as a whole will achieve 58% abatement**
- **The success of this policy is dependent on both CAMEO and a phased reduction programme**

Is regulation the only answer?



- Many environmental policies are reactive; for example The Clean Air Act
- The UK has adopted a proactive form of policy, by addressing a problem before it occurs
- On the other hand, Mercury abatement is a form of end-of-pipe control, removing the mercury at the end of the process – pollutants should be controlled as close up the process chain as possible

Many thanks for listening