

Thursday 15 October 2020

Mercury Inventory in the Russian Federation

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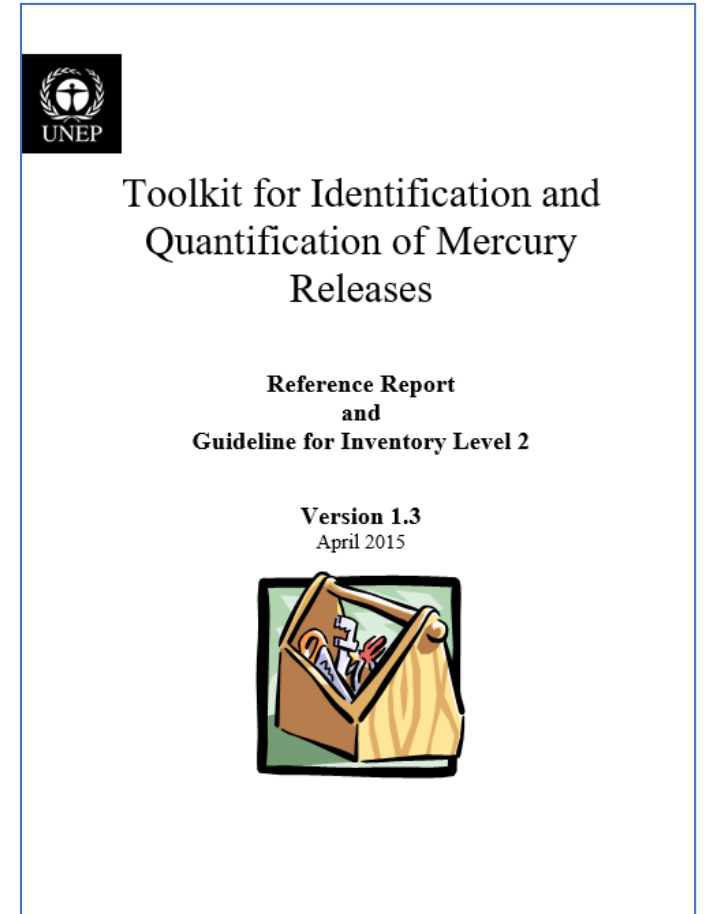
Scientific Research Institute for Atmospheric Air Protection (SRI Atmosphere JSC)

National context

- * Arctic Contamination Action Programme 2003-2005: Assessment of Mercury Releases from the Russian Federation, Arctic Council Action Plan to Eliminate Pollution of the Arctic
- * UNEP 2009-2011: Reducing mercury emissions from coal combustion in the energy sector of the Russian Federation (*report including a characterization of the sector and an emissions inventory for the sector*)
- * UNEP-GEF 2013-2017: Pilot project on the Development of Mercury Inventory in the Russian Federation

Inventory outcomes: Methodology

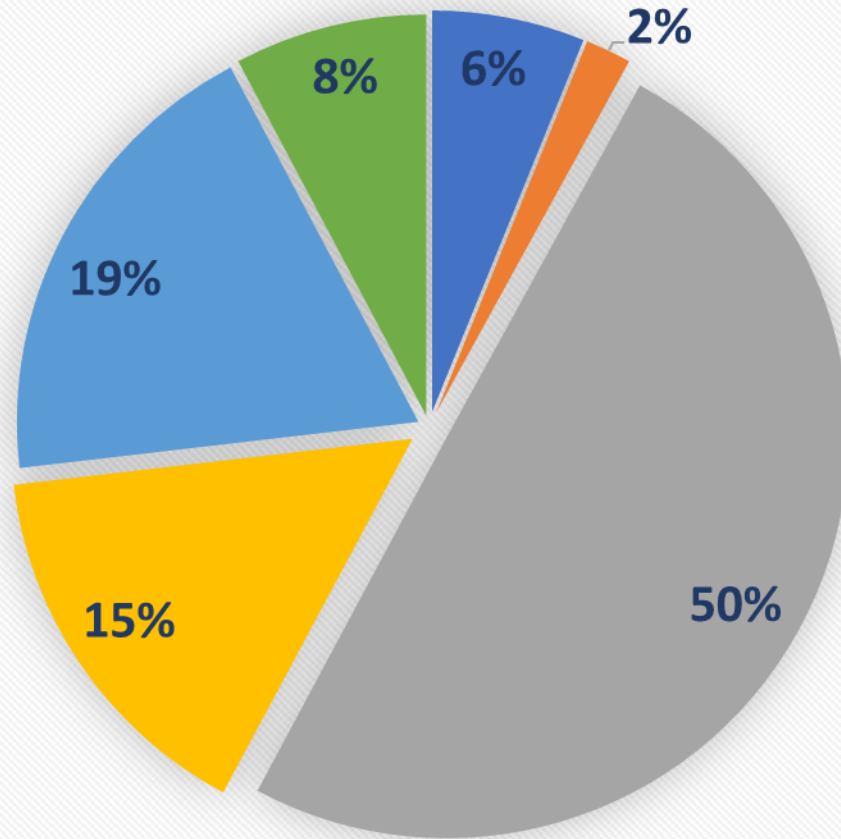
- * Level 2 mass balance Methodology applied (with exceptions to dental amalgam use and cremation)
- * Nationally available/developed release factors applied for various source categories
- * Suggestions for further improvement developed and to be presented in the lessons learned report



Inventory outcomes: estimated totals

Source category	Calculated Hg output, Kg/y (reference year – 2012)							
	Air	Water	Land	By-products and impurities	General waste	Sector specific treatment /disposal	Total releases by source category	Percent of total releases
5.1: Extraction and use of fuels/energy sources	28 590,5	801,1	-	1 106,6	-	8 262,6	38 761	3%
5.2: Primary (virgin) metal production	46 219,8	18 637,0	731 507,0	224 488,3	260 245,6	52 919,6	1 334 017	89%
5.3: Production of other minerals and materials with mercury impurities (incl. cement, pulp and paper, lime and light weight aggregates)	4 788,8	-	-	1 372,5	74,6	1 372,5	7 608	0,5%
5.4: Intentional use of mercury in industrial processes	4 624,6	574,0	1 397,9	2 891,4	-	39 082,4	48 570	3%
5.5: Consumer products with intentional use of mercury (whole life cycle)	4 774,5	4 945,4	10 979,5	-	20 856,8	8 186,4	49 743	3%
5.6: Other intentional product/process use (incl. dental amalgam fillings, manometers and gauges, lab chemicals and equipment)	93,1	2 633,9	43,0	665,1	5 444,7	5 146,1	14 026	1%
5.7: Production of recycled metals	72,8	87,3	-	-	-	4,4	164	0,01%
5.8: Waste incineration and burning	2 047,2	-	-	-	-	1 452,1	3 499	0,23%
5.9: Waste deposition/landfilling and waste water treatment	758,6	43,2	59,6	-	16,9	11,3	890	0,05%
5.10: Crematoria and cemeteries	334,9	-	4 430,9	-	-	-	4 766	0,3%
SUM OF QUANTIFIED RELEASES	91 778	27 641	747 358	230 261	286 639	115 636	1 499 313	100%

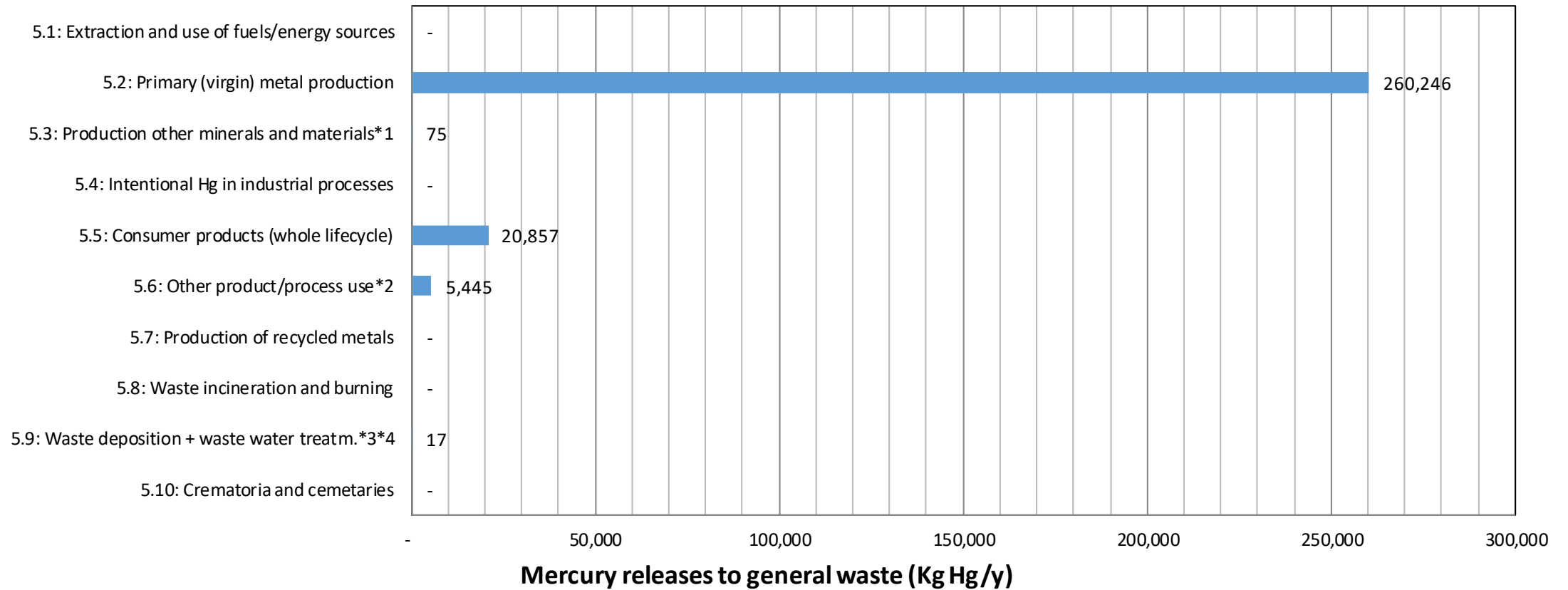
Inventory outcomes: breakdown by media/sector



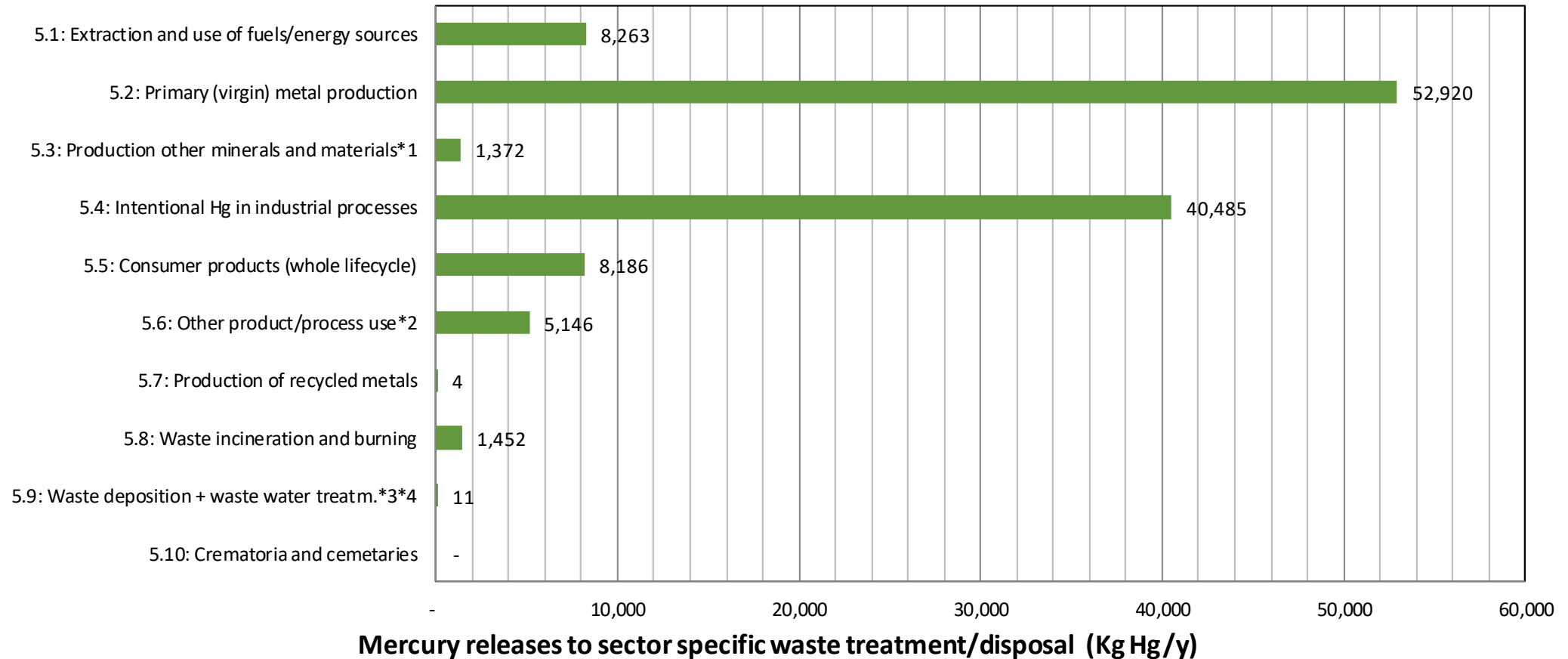
- Air
- Water
- Land
- By-products and impurities
- General waste
- Sector specific treatment /disposal

Total Hg releases estimated = 1 499 313 kg

Inventory outcomes: waste/disposal



Inventory outcomes: waste/disposal



Inventory outcomes: historical data

Mercury in solid waste in the Russian Federation, 2001–2002

Activity category	Mercury in solid waste			
	disposed/landfilled			recycled, the most precise estimate t/year
	the most precise estimate t/year	% of the total	Uncertainty category ²	
Intentional mercury use				
Chlor-alkali production	39	41	A	
VCM production	0.0	0.0	A	4.7
Gold extraction with amalgamation	1.1	1	B	
Production of thermometers	0.1	0.1	A	
Production of cells/batteries, barometers, manometers and other instruments	0.2	0.2	A	
Production of lighting appliances	0.001	0.0	A	2.3
Laboratory applications	2.2	2.3	B	
Other intentional uses	?	-	-	
Total	43	45		7

Derived from: (ACAP) (2005), "Assessment of Mercury Releases from the Russian Federation", Arctic Council Action Plan to Eliminate Pollution of the Arctic.

Inventory outcomes: historical data

Mercury in solid waste in the Russian Federation, 2001–2002

Cont.

Activity category	Mercury in solid waste			
	disposed/landfilled			recycled, the most precise estimate t/year
	the most precise estimate t/year	% of the total	Uncertainty category ²	
Mercury mobilisation from impurities				
Coal — mining and processing	3.1	3.0	B	
Coal — electricity generation	2	2.1	B	
Coal — other uses	0.5	0.5	B	
Oil processing	?	-	C	
Gas and biofuel	?	0	C	
Zinc production	8.5	9	C	5.4
Copper and nickel production	6.6	7.0	C	
Other non-ferrous metals (including gold)	4.2	4.0	C	
Cement production	0.4	0.4	B	
Use of by-products	?	-		
Total	22	23		5.4

Derived from: (ACAP) (2005), “Assessment of Mercury Releases from the Russian Federation”, Arctic Council Action Plan to Eliminate Pollution of the Arctic.

Inventory outcomes: historical data

Mercury in solid waste in the Russian Federation, 2001–2002²⁹

Cont.

Activity category	Mercury in solid waste			
	disposed/landfilled			recycled, the most precise estimate t/year
	the most precise estimate t/year	% of the total	Uncertainty category ²	
Waste processing				
Mercury processing	0.003	0.0	A	
Iron and steel processing	?	-	-	
Municipal and hospital waste:	24	25	B	
- thermometers	20	21	B	
- cells/batteries	1.6	1.7	C	0.02
- light sources	1.6	1.7	B	
- instruments, switches, etc.	0.04	0.0	C	0.5
- amalgam	1	1.1	C	
- other solid waste	?	-	-	
Sewage sludge	5.7	6.0	B	
Metal mercury of unknown origin ¹	?	-	A	21
Total	30	32		22
The cumulative total	95	100		34

□ Derived from: (ACAP) (2005), "Assessment of Mercury Releases from the Russian Federation", Arctic Council Action Plan to Eliminate Pollution of the Arctic.

ICMGP2017

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18 July 2017

ANTHROPOGENIC MERCURY IN RUSSIA: INVENTORY OF RELEASES, EMISSION TESTS, PRIORITIES FOR FURTHER ACTION

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THANK YOU!

Publication in Russian:

<https://drive.google.com/file/d/1AeL7eOrmsUsyb5tO7GqGvY-DAyuzPrDg/view?usp=sharing>

Publication in English:

https://drive.google.com/file/d/1VocfuP3paMQmd56NYNuDnR4YJqhJc91_/view?usp=sharing