

Minamata Convention: Initial Assessment of Turkey

Evaluation of Mercury Inventory in Turkey

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in the environment



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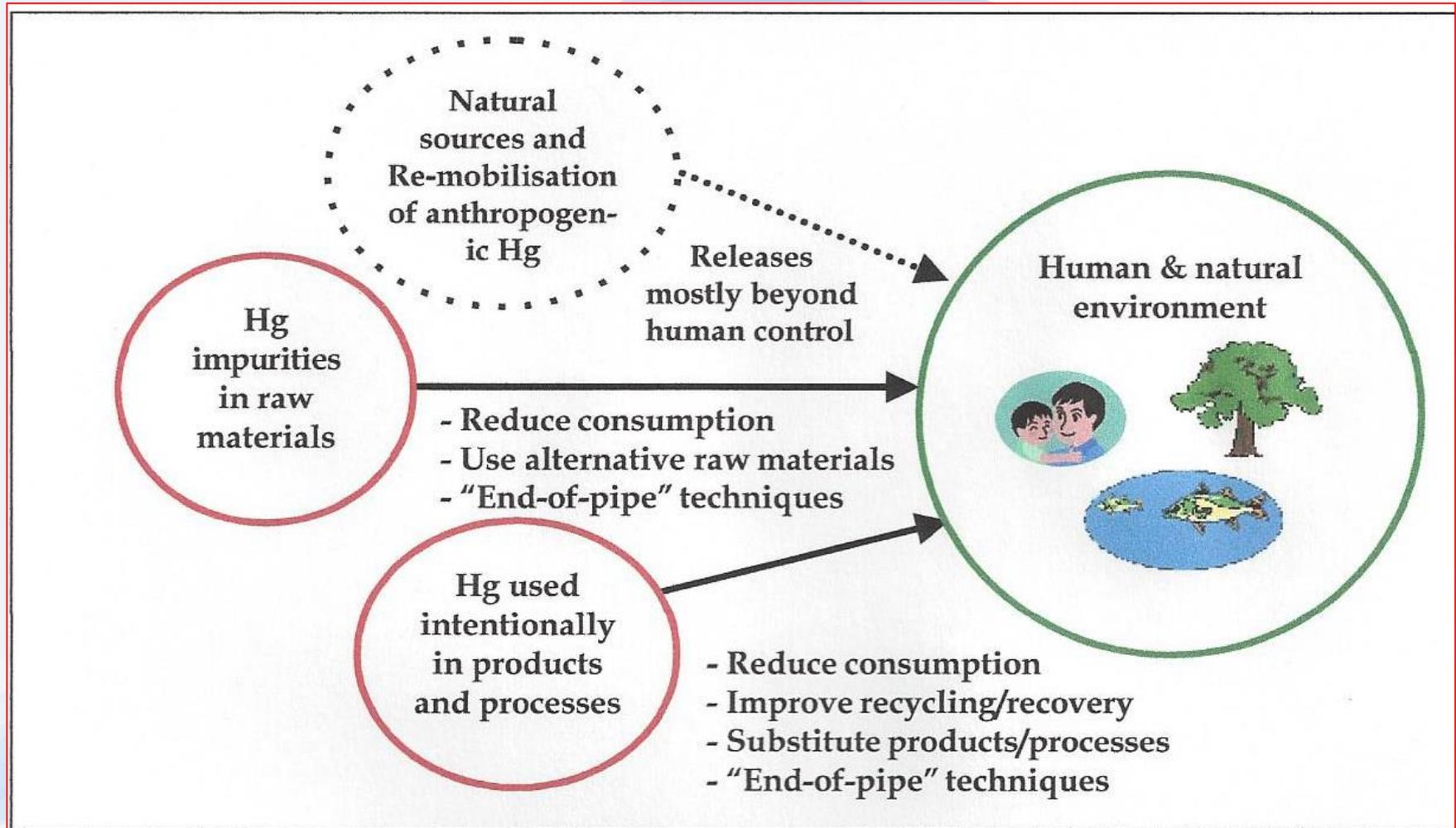
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Mercury Inventory Workshop

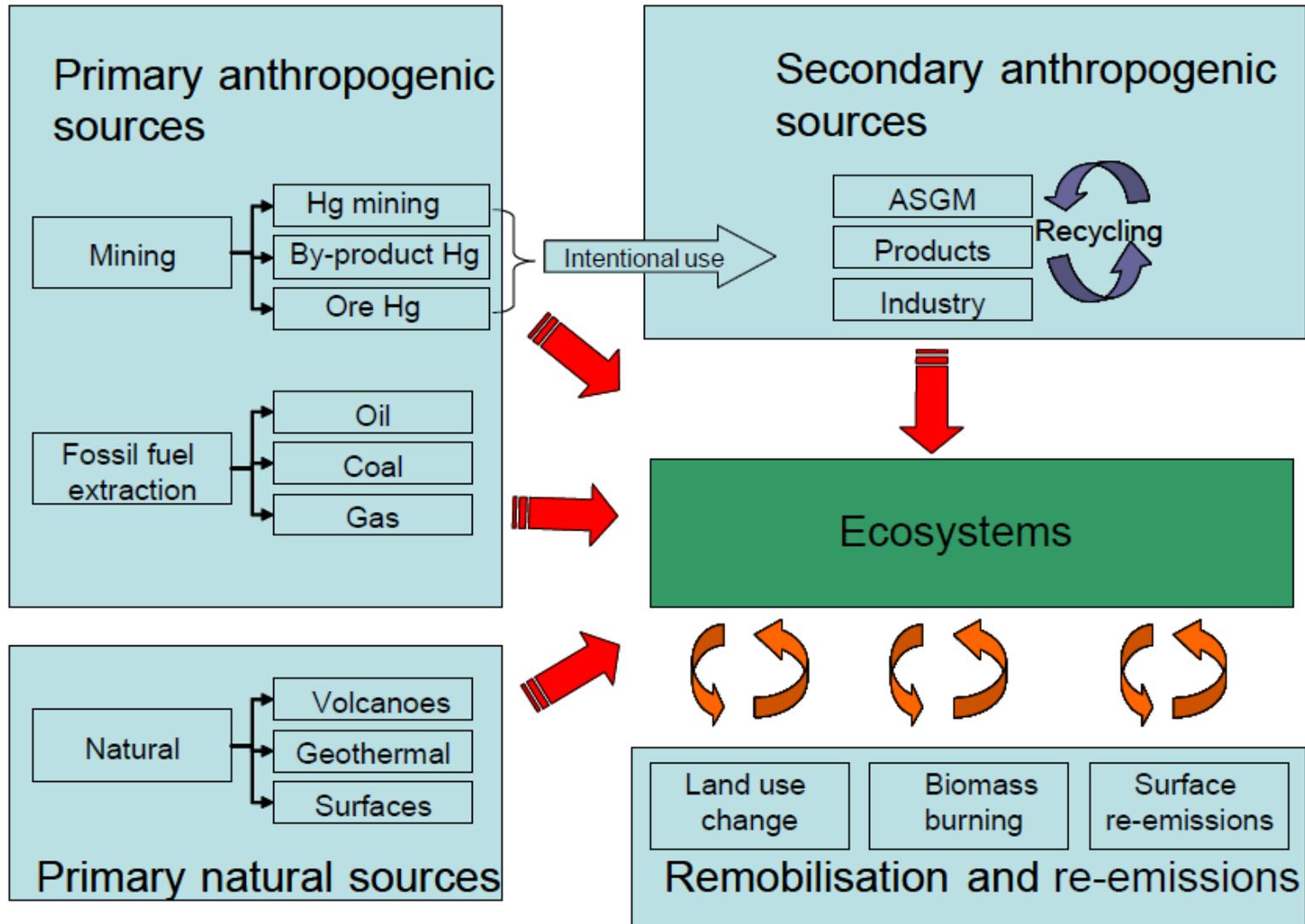
20/06/2018, Point Hotel Ankara, Turkey

Mercury Sources: Related Sectors

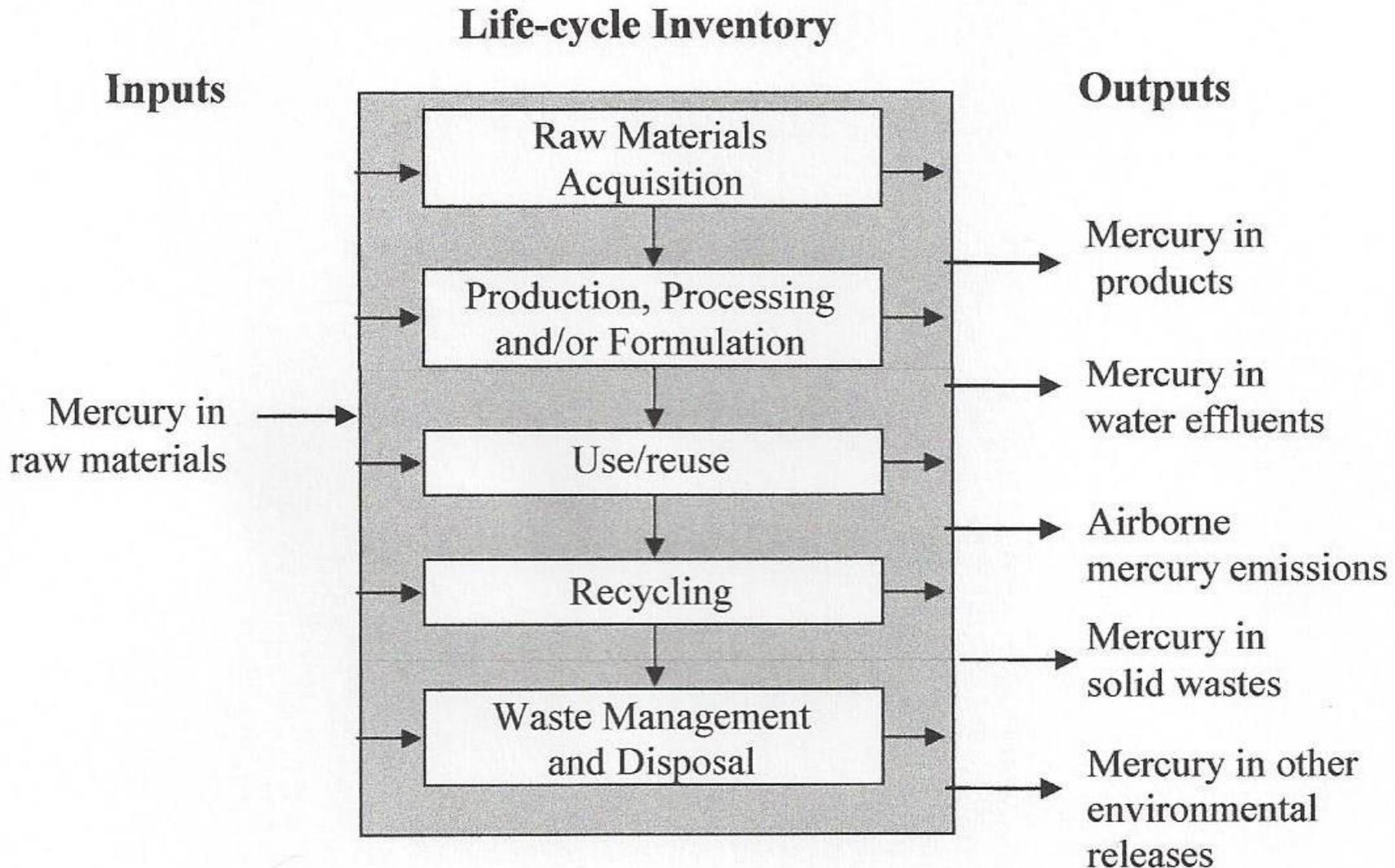
Main sources of mercury releases and main control options



Emission source types and remobilisation processes affecting mercury distribution in the environment



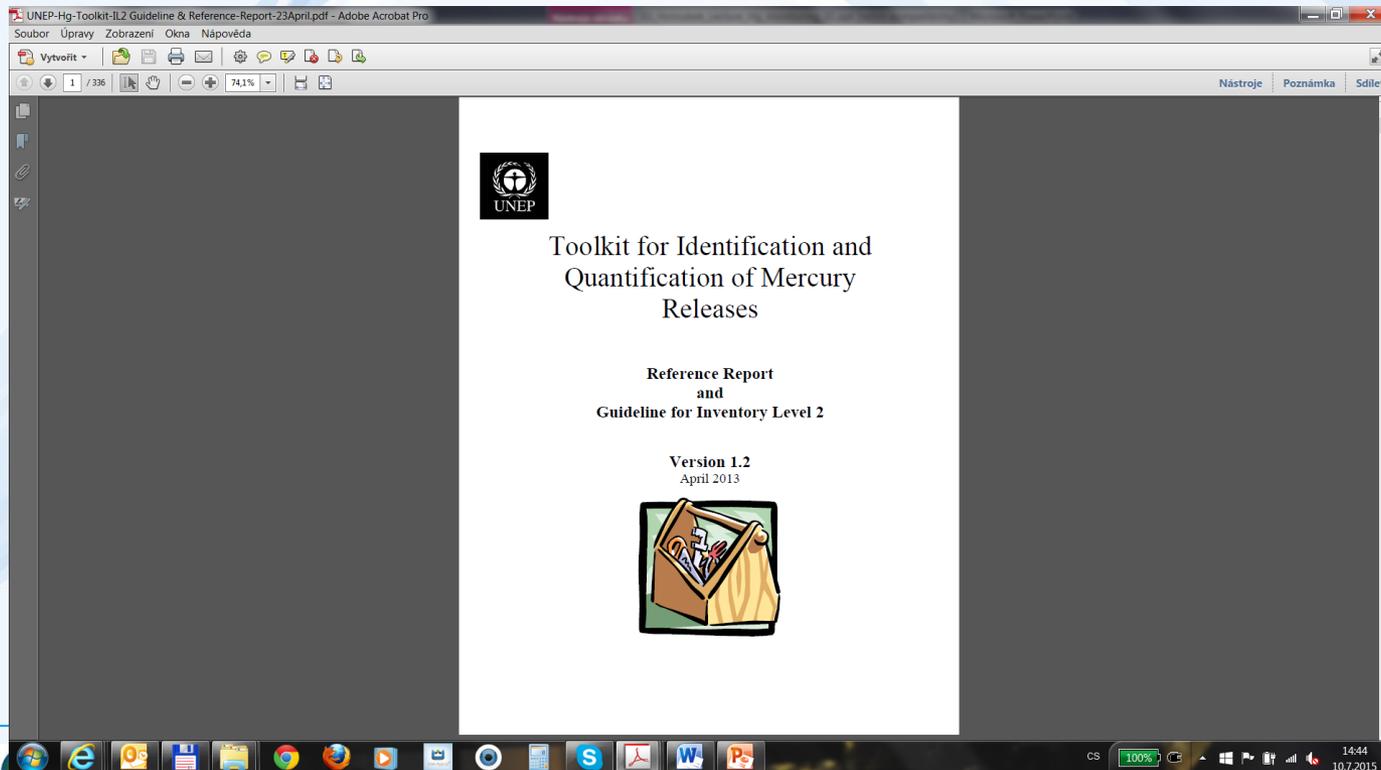
Life-cycle of Hg product or process



Mercury Inventory Toolkit

UNEP's Mercury Inventory Toolkit is intended to assist countries in developing national mercury release inventories.

The Toolkit provides a standardized methodology, enabling countries to produce consistent and well-documented inventories.



Toolkit for Identification and Quantification of Mercury Releases

"Inventory Level 2" is the comprehensive version, including a detailed description of all mercury sources. It allows the development of a detailed mercury inventory by using specific input and output distribution factors.

"Inventory Level 1" provides a simplified version of the Toolkit, as well as calculation spreadsheets that allows the development of an overview mercury inventory, by using the default factors.

Mercury Toolkit

The newly revised Toolkit for identification and quantification of mercury releases - Inventory Level 1.

The Toolkit consists of 6 separate documents:

- ↪ This Guideline for Inventory Level 1;
- ↪ An electronic spreadsheets for calculation of estimates of mercury inputs and releases on Inventory Level 1;
- ↪ Two templates for data collection letters;
- ↪ An Inventory Reporting Template; and
- ↪ A Toolkit Reference Report.

Mercury Toolkit

This guideline works closely together with the Toolkit electronic Inventory Level 1 spreadsheet for calculation of estimates of mercury inputs and releases.

The guideline and the calculation spreadsheet bring step by step through the development of national mercury inventory on Inventory Level 1.

The design of Inventory Level 1 makes it simple to organise and calculate the first national mercury inventory.

Mercury Toolkit

The Inventory Level 1 guideline and calculation spreadsheet is organised with the following steps:

Step 1: Getting started;

Step 2: Energy consumption and fuel production;

Step 3: Domestic production of metals and raw materials;

Step 4: Domestic production and processing with intentional mercury use;

Step 5: Waste treatment and recycling;

Step 6: General consumption of mercury in products, as metal mercury and as mercury containing substances;

Step 7: Crematoria and cemeteries;

Step 8: Miscellaneous mercury sources not quantified on Inventory Level 1;

Step 9: Reporting your inventory and

Step 10: Refining your inventory (optional).

Examples of anthropogenic mercury releases to the environmental media

Destinations of releases to the environment and types of releases to each receiving environmental medium:

Air - the atmosphere: Point sources and diffuse sources from which release may be spread locally, regionally and hemispherically/globally with air masses.

- ↳ Emissions from major point sources such as coal fired power plants, metal extraction, waste incineration, chlor-alkali facilities, secondary scrap recycling/smelting, cement production, industrial inorganic chemicals production and diffuse sources such as housing (fossil fuel combustion);
- ↳ Emissions from artisanal gold mining;
- ↳ Emissions from cremation, primarily due to dental fillings containing mercury;
- ↳ Emissions from mercury-containing paints;
- ↳ Diffuse releases from uncollected waste products (fluorescent lamps, batteries, thermometers, mercury switches, lost teeth with amalgam fillings etc.);
- ↳ Evaporation of previous discharges to soil and water;
- ↳ Evaporation of mercury disposed of on landfills.

Examples of anthropogenic mercury releases to the environmental media

Water – aquatic environment: Point sources and diffuse sources from which mercury will be spread to marine environments (oceans), and freshwaters (rivers, lakes etc.).

- ↪ **Direct discharges from industry and households** to aquatic environments;
- ↪ **Emissions from artisanal gold mining;**
- ↪ **Indirect discharges** via waste water treatment systems;
- ↪ **Surface run-off and leachate** from mercury contaminated soil and landfills without leachate collecting membrane and leachate water cleaning system;
- ↪ **Wash-out of mercury** previously applied or deposited on land.

The mass balance principle, inputs and outputs

The mercury release calculations used in this Toolkit are based on the mass balance principle:

All the mercury fed into the system (e.g. an industrial sector) with materials and fuels will come out again, either as releases to the environment or in some kind of product stream.

In other words:

"Sum of inputs = sum of outputs".

The mass balance principle, inputs and outputs

Inputs: Therefore we quantify the **mercury inputs** from the amount of mercury containing material fed **into the system** (called "activity rate") and general data on the mercury concentration in the feed material (called "input factor").

Outputs: The mercury releases from the system are calculated **by distributing this mercury amount on the relevant release pathways** based on available data on how the releases (or "outputs") are generally distributed in this sector. For calculating this distribution, we use general **"output distribution factors"**.

The mass balance principle, inputs and outputs

On Inventory Level 1, these calculations are automatic, and are based on default input factors and default output distribution factors, which are already entered in the electronic calculation spreadsheet.

So all you need to do is to enter the amount of material used or produced in each sector, as carefully described in the individual steps of this Guideline.

Basic quantification equation

Estimated mercury release to pathway Y

=

Activity rate * Input factor * Output distribution factor for
pathway Y

The background for all default input factors and output distribution factors is also described in detail in the Toolkit Reference Report, in section 5.

Appendix 1 to this guideline provides background information on how the default factors were implemented in Inventory Level 1.

Remarks

These simplified results aim at providing a useful first insight into your country's situation on mercury inputs and releases. Generally, **it may be useful to produce refined inventories at later stages**, as the work with national management of mercury develops further.

Specifically, it is recommended to develop more detailed and refined inventories for targeted sectors or activities prior to launching any far reaching regulation or management procedures for these sectors or activities, preferably in cooperation with the relevant stakeholders.

For users who wish to reflect mercury management improvements in their inventory, **which are not reflected on Inventory Level 1**, the Toolkit Reference Report provides more detailed descriptions of the source categories, and release estimate calculations **can be made in more detail in the Inventory Level 2 spreadsheet pages.**

Remarks

It should be noted that **for some mercury source categories**, the data available for developing the default factors have been **very scarce**, and some default factors are therefore associated with **substantial uncertainty**.

In some cases where detailed mass balances have **not been available**, default output distribution factors were developed preliminarily based in expert assessment. In these cases the output distribution default factors are considered **"signal values"**, which indicate a **probable release distribution**. As mentioned, the available data background for the default factors can be seen in the Toolkit Reference Report.

Each source-category section ("Step") in this guideline describes the limitations of Inventory Level 1 and lists the main factors which may influence the actual inputs and releases, including cases of more technically advanced source configurations, and cases with particularly uncertain default factors, including **"signal values"**.

Step 1 – Getting started

Open spreadsheet page Step 1 and fill in the information requested, using the advice given in this guideline.

The coloured cells contain complex formulas without which the calculations will not work, and they are therefore protected and no changes can be made in them on Inventory Level 1.

In Inventory Level 1, only the white cells are open for entering data in the spreadsheet.

| 7 | Source category | Source present? | Activity rate Annual production /waste disposal | Unit | Standard estimate | Estimated Hg releases, standard estimate | | | By-products and impurities |
|----|---|-----------------|---|-------------------------------|-------------------|--|----------|----------|----------------------------|
| 8 | Production of recycled of metals | Y/N? | | | | Air | Water | Land | |
| 9 | Production of recycled mercury ("secondary production") | | | Mercury produced, kg/y | Present? | Present? | Present? | Present? | Present? |
| 10 | Production of recycled ferrous metals (iron and steel) | | | Number of vehicles recycled/y | Present? | Present? | Present? | Present? | Present? |
| 11 | | | | | | | | | |
| 12 | Waste incineration | | | | | | | | |
| 13 | Incineration of municipal/general waste | | | Waste incinerated, t/y | Present? | Present? | Present? | Present? | Present? |
| 14 | Incineration of hazardous waste | | | Waste incinerated, t/y | Present? | Present? | Present? | Present? | Present? |
| 15 | Incineration and open burning of medical waste | | | Waste incinerated, t/y | Present? | Present? | Present? | Present? | Present? |
| 16 | Sewage sludge incineration | | | Waste incinerated, t/y | Present? | Present? | Present? | Present? | Present? |
| 17 | Open fire waste burning (on landfills and informally) | | | Waste burned, t/y | Present? | Present? | Present? | Present? | Present? |
| 18 | | | | | | | | | |
| 19 | Waste deposition/landfilling and waste water treatment | | | | | | | | |
| 20 | Controlled landfills/deposits | | | Waste landfilled, t/y | Present? | Present? | Present? | Present? | Present? |



When you have established an overview of your work in Step 1, simply proceed to Step 2 of the guideline and the spreadsheet to proceed with the inventory work.

Data collection

Data collection may take time, and once specific data are requested from data owners it may take time before responses are received.

As the inventory should aim at describing the mercury situation in (or around) a given year, try to **get data for that same year from the different data sources**. If some data types are not available for that year, data from other adjacent years can be used, or averages over several adjacent years, if this describes the situation better.

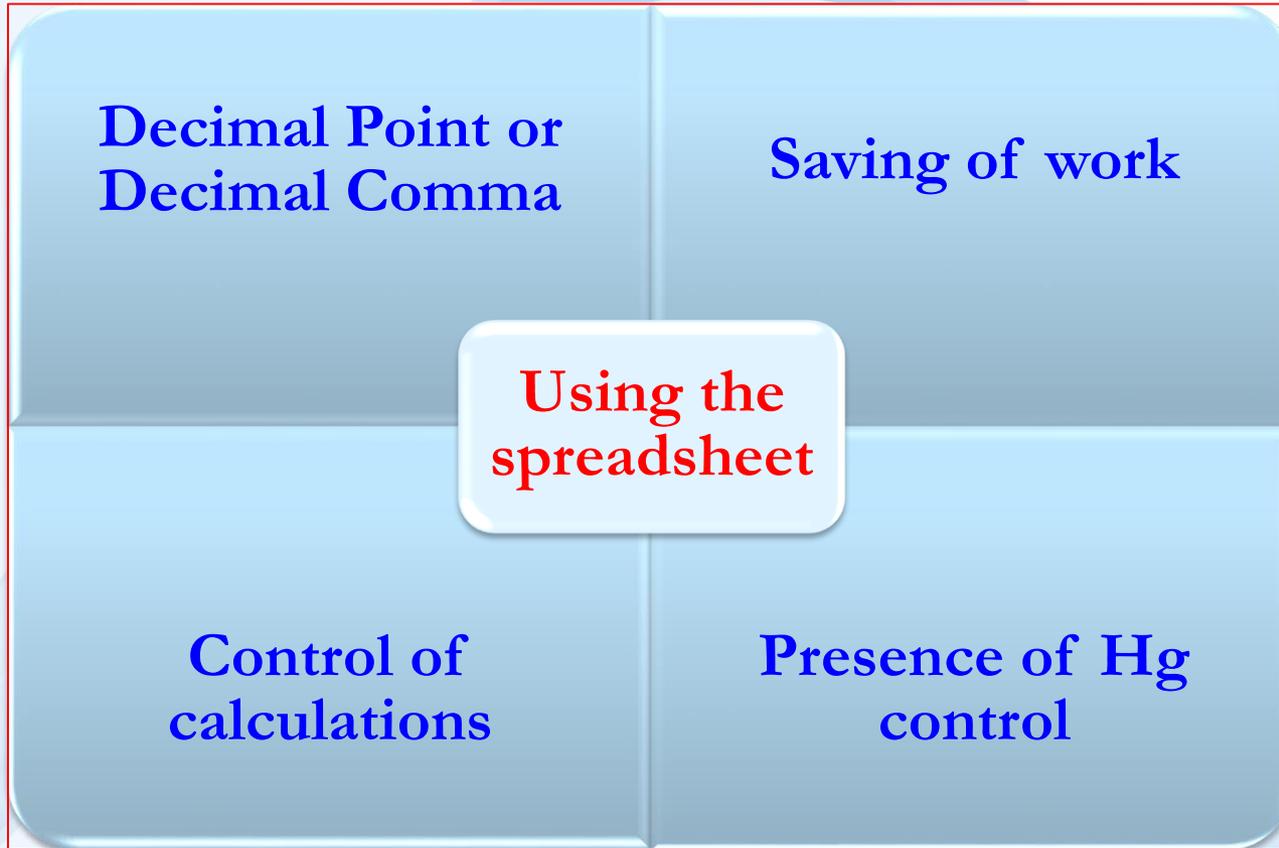
Data collection

Therefore, it is recommended to start data collection **early for all inventory steps**, and not wait for data for one step before proceeding to the next inventory step.

This also allows for **coordination of data collection** in cases where several data types are requested from the same sources of information (such as for example the national statistics bureau, or similar).

Data units !!!

Using the spreadsheet



Understanding the calculated results

Try opening the Inventory Level 1 calculation spreadsheet and open the page entitled "Step 2 Energy" by clicking on the page label with this title at the bottom of the screen window. You will first see a page as shown in Figure 1.

Figure 1-1 Example of an inventory spreadsheet page (Step 2 Energy).

| Source category | Source present? | Annual consumption /production | Unit | Estimated Hg input, Kg Hg/y | Estimated Hg releases, standard estimates, Kg Hg/y | | | | | | Sector specific waste treatment /disposal | Cat. no. |
|---|-----------------|--------------------------------|------------------------------------|-----------------------------|--|-----------|-----------|----------------------|---------------|-----------|---|----------|
| | Y/N/? | | | Standard estimate | Air | Water | Land | Impurity in products | General waste | | | |
| Coal combustion in large power plants | | | t coal combusted/y | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | 5.1.1 | |
| Other coal uses | | | t coal used/y | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | 5.1.2 | |
| Combustion/use of petroleum coke and heavy oil | | | t oil product combusted/y | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | 5.1.3 | |
| Combustion/use of diesel, gasoil, petroleum, kerosene | Y | 10.000.000 | t oil product combusted/y | 55 | 55.0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.3 | |
| Biomass fired power and heat production | | | t biomass combusted/y (dry weight) | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | 5.1.6 | |
| Charcoal combustion | | | t charcoal combusted/y | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | 5.1.6 | |
| Fuel production | | | | | | | | | | | | |
| | | | t crude oil | | | | | | | | | |

Understanding the calculated results

Try opening the Inventory Level 1 calculation spreadsheet and open the page entitled "Step 2 Energy" by clicking on the page label with this title at the bottom of the screen window. You will first see a page as shown in Figure 1.

Figure 1-1 Example of an inventory spreadsheet page (Step 2 Energy).

| Source category | Source present? | Annual consumption /production | Unit | Estimated Hg input, Kg Hg/y | Estimated Hg releases, standard estimates, Kg Hg/y | | | | | | Sector specific waste treatment /disposal | Cat. no. |
|---|-----------------|--------------------------------|------------------------------------|-----------------------------|--|-----------|-----------|----------------------|---------------|-----------|---|----------|
| | Y/N/? | | | Standard estimate | Air | Water | Land | Impurity in products | General waste | | | |
| Energy consumption | Y/N/? | | | | | | | | | | | |
| Coal combustion in large power plants | | | t coal combusted/y | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | 5.1.1 |
| Other coal uses | | | t coal used/y | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | Present ? | 5.1.2 |
| Combustion/use of petroleum coke and heavy oil | | | t oil product combusted/y | Present ? | Present ? | Present ? | | | | | | |
| Combustion/use of diesel, gasoil, petroleum, kerosene | Y | 10.000.000 | t oil product combusted/y | 55 | 55,0 | 0, | | | | | | |
| Biomass fired power and heat production | | | t biomass combusted/y (dry weight) | Present ? | Present ? | Present ? | | | | | | |
| Charcoal combustion | | | t charcoal combusted/y | Present ? | Present ? | Present ? | | | | | | |
| Fuel production | | | | | | | | | | | | |
| | | | t crude oil | | | | | | | | | |

When you have entered "Y" to show that the source category in question is present in your country, and you have entered an input amount, say the annual consumption/use of diesel, gasoil, etc., the spreadsheet will automatically calculate the result types shown in the spreadsheet page. Remember, data can only be entered in the white cells.

Examples of anthropogenic mercury releases to the environmental media

Land/soil – terrestrial environment: General soil surfaces and ground water.

- ↙ **Diffuse releases from uncollected waste products** (batteries, thermometers, mercury switches, lost teeth with amalgam fillings etc.);
- ↙ **Local releases from industry: On site materials and waste storage,** broken/unused pipes, and equipment and building material contaminated with mercury;
- ↙ **Spreading of sewage sludge** with mercury content on agricultural land (used as fertilizer);
- ↙ **Application on land, seeds or seedlings of pesticides** with mercury compounds;
- ↙ **Use of solid residues from waste incineration and coal combustion** for construction purposes (slag/bottom ash and fly ash);
- ↙ **Burial of persons** with dental amalgam fillings.

5.1 Extraction and use of fuels/energy sources



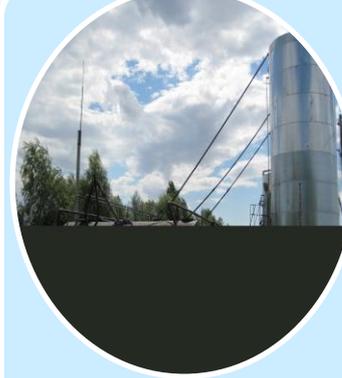
**Coal
combustion
in large
power plants**



**Other coal
use**



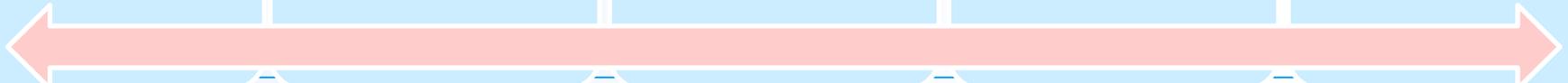
**Mineral oils -
extraction,
refining and
use**



**Natural gas -
extraction,
refining and
use**



**Biomass fired
power and
heat
production**



Sources – Toolkit Level 1

| Source category | Source present? |
|---|-----------------|
| | Y/N/? |
| Energy consumption | |
| Coal combustion in large power plants | Y |
| Other coal uses | Y |
| Combustion/use of petroleum coke and heavy oil | Y |
| Combustion/use of diesel, gasoil, petroleum, kerosene | Y |
| Biomass fired power and heat production | Y |
| Charcoal combustion | Y |
| Fuel production | |
| Oil extraction | Y |
| Oil refining | Y |
| Extraction and processing of natural gas | Y |

| | | | | | | | | | | | | |
|---------------------------------------|---|------------|---------------------|---|--------|--------------------|-------------------------------|-------------------|------------------|-----------------------|---------------------|-------|
| Coal combustion in large power plants | Y | 76 940 000 | Coal combusted, t/y | Y | 11 541 | 10 156,1 | 0,0 | 0,0 | 0,0 | 0,0 | 1 384,9 | 5.1.1 |
| | | | | Relevant pollution abatement options (guide: click white cells) | | 0: No filters used | 1: Simple particulate filters | 2: Fabric filters | 3: Efficient APC | 4: Very efficient APC | 5: Mercury specific | |

Sources – Toolkit Level 1

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

Formula bar: $=KDYŽ(NEBO(\$B15=yes;\$B15=yes);SUMA('5-1 Fuels'!Y43:Y47); KDYŽ(NEBO(\$B15=no;\$B15=no);"-"; KDYŽ(\$B15=que;que; pres)))$

| Source category | Source present? | Activity rate Annual consumption /production | Unit | Include Hg controls in estimation? (y/n) | Estimated Hg input, Kg Hg/y | Estimated Hg releases, standard estimates, Kg Hg/y | | | | | | Cat. no. | Notes |
|--|-----------------|--|----------------------------|---|-----------------------------|--|----------------------------|-------------------|----------------------------|-----------------------|---|----------|----------------|
| Energy consumption | Y/N/? | | | | Standard estimate | Air | Water | Land | By-products and impurities | General waste | Sector specific waste treatm. /disposal | | |
| Coal combustion in large power plants | Y | 76 940 000 | Coal combusted, t/y | Y | 11 541 | 9 463,6 | 0,0 | 0,0 | 0,0 | 0,0 | 2 077,4 | 5.1.1 | |
| | | | | Relevant pollution abatement options (guide: click white cells) | | 0: No filters used | 1: Simple particle filters | 2: Fabric filters | 3: Efficient APC | 4: Very efficient APC | 5: Mercury specific | | |
| | | | | Enter per cent of total activity rate per type: | | 0 | 80 | | 20 | | | | Non-default co |
| Coal combustion in coal fired industrial boilers | ? | | Coal combusted, t/y | ? | ? | ? | ? | ? | ? | ? | ? | 5.1.2.1 | |
| Other coal uses | Y | 26 894 000 | Coal used, t/y | | 3 586 | 3 585,9 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.2.2 | |
| Combustion/use of petroleum coke and heavy oil | Y | 96 233 | Oil product combusted, t/y | Y | 5 | 4,8 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.3 | |
| | | | | Relevant pollution abatement options (guide: click white cells) | | No filters used | ESP or scrubber | cESP and FGD | | | | | |
| | | | | Enter per cent of total activity rate per type: | | 0 | 100 | | | | | | Non-default co |
| Combustion/use of diesel, gasoil, petroleum, kerosene, LPG and other light to medium distillates | Y | 30 954 000 | Oil product combusted, t/y | | 170 | 170,2 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.3 | |

Navigation: Step1-Country data | Step2-Energy | Step3-Metals-RawMat | Step4-Industrial Hg use | Step5-Waste treatment+recycling | Step6-Hg products-substances | Step7

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Sources – Toolkit Level 1

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

Formula bar: $=KDYŽ(NEBO(\$B15=yes; \$B15=yes); SUMA('5-1 Fuels'!Y43:Y47); KDYŽ(NEBO(\$B15=no; \$B15=no); "-"; KDYŽ(\$B15=que; que; pres)))$

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|----|--|---|----------------|-------------------------|---|-------|---------|-----|-----|------|-----|------|-------|
| 16 | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | |
| 18 | Use of raw or pre-cleaned natural gas | Y | 46 729 000 000 | Gas used, Nm³/y | | 4 673 | 4 672,9 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.4 |
| 19 | Use of pipeline gas (consumer quality) | Y | 45 619 000 | Gas used, Nm³/y | | 0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.4 |
| 20 | Biomass fired power and heat production | Y | 1 876 000 | Biomass combusted, t/y | | 56 | 56,3 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.6 |
| 21 | Charcoal combustion | Y | 8 608 000 | Charcoal combusted, t/y | | 1 033 | 1 033,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.6 |
| 22 | | | | | | | | | | | | | |
| 23 | Fuel production | | | | | | | | | | | | |
| 24 | Oil extraction | Y | 2 573 000 | Crude oil produced, t/y | | 9 | 0,0 | 1,7 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.3 |
| 25 | Oil refining | Y | 29 605 000 | Crude oil refined, t/y | | 101 | 25,2 | 1,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.1.3 |
| 26 | Extraction and processing of natural gas | Y | 367 000 000 | Gas produced, Nm³/y | | 37 | 5,5 | 7,3 | 0,0 | 11,0 | 0,0 | 12,8 | 5.1.4 |
| 27 | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | |
| 33 | | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | | |
| 37 | | | | | | | | | | | | | |
| 38 | | | | | | | | | | | | | |
| 39 | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | |

Navigation: Step1-Country data | **Step2-Energy** | Step3-Metals-RawMat | Step4-Industrial Hg use | Step5-Waste treatment+recycling | Step6-Hg products-substances | Step7

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5.7 Production of recycled metals ("secondary" metal production)



Production of recycled mercury
("secondary production")



Production of recycled ferrous metals
(iron and steel)



Production of other recycled metals

Sources – Toolkit Level 1

| Source category | Source present? |
|--|-----------------|
| | Y/N/? |
| Primary metal production | |
| Mercury (primary) extraction and initial processing | N |
| Production of zinc from concentrates | N |
| Production of copper from concentrates | Y |
| Production of lead from concentrates | N |
| Gold extraction by methods other than mercury amalgamation | ? |
| Alumina production from bauxite (aluminium production) | Y |

Sources – Toolkit Level 1

| Source category | Source present? |
|---|-----------------|
| | Y/N/? |
| Primary ferrous metal production (iron, steel production) | Y |
| Gold extraction with mercury amalgamation - without use of retort | Y |
| Gold extraction with mercury amalgamation - with use of retorts | N |
| Other materials production | |
| Cement production | Y |
| Pulp and paper production | Y |
| Production of chemicals and polymers | |
| Chlor-alkali production with mercury-cells | N |
| VCM production with mercury catalyst | N |
| Acetaldehyde production with mercury catalyst | N |

Sources – Toolkit Level 1

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

| Gold extraction with mercury amalgamation - from whole ore | | | | | | | | | | | | |
|--|-----------------|-------------------------------|------------------------|---|-----------------------------|--|------------------|---------------------------------|---|---------------|--|-----|
| A | B | C | D | E | F | G | H | I | J | K | L | M |
| Source category | Source present? | Activity rate | | | Estimated Hg input, Kg Hg/y | Estimated Hg releases, standard estimates, Kg Hg/y | | | | | | |
| | Y/N/? | Annual consumption/production | Unit | Include Hg controls in estimation? (y/n) | Standard estimate | Air | Water | Land | By-products and impurities | General waste | Sector specific waste treatm./disposal | Ca |
| Primary metal production | | | | | | | | | | | | |
| Mercury (primary) extraction and initial processing | N | | Mercury produced, t/y | | - | - | - | - | - | - | - | 5.2 |
| Production of zinc from concentrates | N | | Concentrate used, t/y | | - | - | - | - | - | - | - | 5.2 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Production of copper from concentrates | Y | 381 216 | Concentrate used, t/y | Y | 11 436 | 1 143,6 | 228,7 | 0,0 | 4 803,3 | 0,0 | 5 260,8 | 5.2 |
| | | | | Relevant pollution abatement options (guide: click white cells) | | No filters used or coarse, dry PM retention | Wet gas cleaning | Wet gas cleaning and acid plant | Wet gas cleaning, acid plant and Hg specific filter | | | |
| | | | | Enter per cent of total activity rate per type: | | 0 | | 100 | | | | |
| Production of lead from concentrates | N | | Concentrate used, t/y | | - | - | - | - | - | - | - | 5.2 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Gold extraction by methods other than mercury amalgamation | ? | 27 661 000 | Gold ore used, t/y | | ? | ? | ? | ? | ? | ? | ? | 5.2 |
| Alumina production from bauxite (aluminium production) | Y | 494 092 | Bauxit processed, t/y | | 247 | 37,1 | 24,7 | 0,0 | 0,0 | 160,6 | 24,7 | 5.2 |
| Primary ferrous metal production (pig iron production) | Y | 10 304 272 | Pig iron produced, t/y | | 515 | 489,5 | 0,0 | 0,0 | 0,0 | 0,0 | 25,8 | 5.2 |
| Gold extraction with mercury amalgamation - from whole ore | ? | | Gold produced, kg/y | | ? | ? | ? | ? | ? | ? | ? | 5.2 |

Step1-Country data / Step2-Energy / **Step3-Metals-RawMat** / Step4-Industrial Hg use / Step5-Waste treatment+recycling / Step6-Hg products-substances / Step7

Připraven 80%

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Sources – Toolkit Level 1

| | | | |
|--|---|------------|------------------------|
| Gold extraction by methods other than mercury amalgamation | ? | 27 661 000 | Gold ore used, t/y |
| Alumina production from bauxite (aluminium production) | Y | 494 092 | Bauxit processed, t/y |
| Primary ferrous metal production (pig iron production) | Y | 10 304 272 | Pig iron produced, t/y |
| Gold extraction with mercury amalgamation - from whole ore | ? | | Gold produced, kg/y |

5.3 Production of other minerals and materials with mercury impurities



Cement production



Production of lime and light weight aggregates



Sources – Toolkit Level 1

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

Soubor Domů Vložení Rozložení stránky Vzorce Data Revize Zobrazení Acrobat

Vložit Vymout Kopírovat Kopírovat formát Schránka

Arial 10 Písmo Zarovnáání Zalamovat text Sloučit a zarovnat na střed Číslo

Podmíněné formátování jako tabulku buňky Styly Vložit Odstranit Formát Úpravy

Automatické shrnutí Vyplnit Vymazat Seřadit a filtrovat Najít a vybrat

| A19 | Gold extraction with mercury amalgamation - from whole ore | | | | | | | | | | | |
|-----|--|---|----------------------------------|--|--------|-----------|---|---|--|---|-----|-----|
| A | B | C | D | E | F | G | H | I | J | K | L | M |
| 21 | | | | | | | | | | | | |
| 22 | Gold extraction with mercury amalgamation - from concentrate | N | Gold produced, kg/y | | - | - | - | - | - | - | - | 5.2 |
| 23 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | Other materials production | | | | | | | | | | | |
| 26 | Cement production | Y | 80 000 000 Cement produced, t/y | Y | 10 160 | 7 112,2 | 0,0 | 0,0 | 3 048,1 | 0,0 | 0,0 | 5.3 |
| 27 | | | | 1) WITH WASTE USED as fuel (>3% of energy); relevant pollution abatement options | | No filter | Simple particle control (ESP / PS / FF) | Optimized particle control (FF+SNCR / FF+WS / ESP+FGD / optimized FF) | Efficient air pollution control (FF+DS / ESP+DS / ESP+WS / ESP+SNCR) | Very efficient Hg pollution control (wetFGD+ACI / FF+scrubber+SNCR) | | |
| 28 | | | | Enter per cent of total activity rate per type: | | | 25 | | | | | |
| 29 | | | | 2) NO/LOW WASTE use as fuel; relevant pollution abatement options | | No filter | Simple particle control (ESP / PS / FF) | Optimized particle control (FF+SNCR / FF+WS / ESP+FGD / optimized FF) | Efficient air pollution control (FF+DS / ESP+DS / ESP+WS / ESP+SNCR) | Very efficient Hg pollution control (wetFGD+ACI / FF+scrubber+SNCR) | | |
| 30 | | | | Enter per cent of total activity rate per type: | | 0 | 75 | | | | | Nor |
| 31 | Pulp and paper production | Y | Biomass used for production, t/y | | 0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5.3 |
| 32 | | | | | | | | | | | | |
| 33 | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | |

Step1-Country data Step2-Energy Step3-Metals-RawMat Step4-Industrial Hg use Step5-Waste treatment+recycling Step6-Hg products-substances Step7

Připraven 80%

Microsoft Outlook ... Microsoft Excel - H...

16:39 19.06.2018

Sources – Toolkit Level 1

| | | | |
|---------------------------|---|-----|----------------------------------|
| Pulp and paper production | Y | ??? | Biomass used for production, t/y |
|---------------------------|---|-----|----------------------------------|

5.5 Consumer products with intentional use of mercury



Thermometers with mercury



Electrical switches and relays with mercury



Light sources with mercury



Batteries with mercury



Paints



Polyurethane with mercury catalysts

5.6 Other intentional product/process uses



Manometers and gauges



Laboratory chemicals and equipment



Miscellaneous product uses, mercury metal uses, and other sources

Sources – Toolkit Level 1

| Source category | Source present? Y/N/? |
|--|--------------------------|
| Production of products with mercury content | |
| Hg thermometers (medical, air, lab, industrial etc.) | N |
| Electrical switches and relays with mercury | N |
| Light sources with mercury (fluorescent, compact, others: see guideline) | N |
| Batteries with mercury | N |
| Manometers and gauges with mercury | N |
| Biocides and pesticides with mercury | N |
| Paints with mercury | N |
| Skin lightening creams and soaps with mercury chemicals | N |

Sources – Toolkit Level 1

| Source category | Source present? |
|---|-----------------|
| | Y/N/? |
| Medical blood pressure gauges (mercury sphygmomanometers) | N |
| Other manometers and gauges with mercury | N |
| Laboratory chemicals | N |
| Other laboratory and medical equipment with mercury | N |
| Production of recycled of metals | |
| Production of recycled mercury ("secondary production") | ? |
| Production of recycled ferrous metals (iron and steel) | Y |

Sources – Toolkit Level 1

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

Note: Data for some of these source sub-categories were entered in the sheet "Insert IL2 results". The calculations shown above for the same source sub-categories

| Source category | Source present? Y/N/? | Activity rate Annual consumption /production | Unit | Estimated Hg input, Kg Hg/y Standard estimate | Estimated Hg releases, standard estimates, Kg Hg/y | | | | |
|--|--------------------------|---|-----------------------------------|--|--|-------|------|----------------------------|---------------|
| | | | | | Air | Water | Land | By-products and impurities | General waste |
| Production of chemicals | | | | | | | | | |
| Chlor-alkali production with mercury-cells | N | | Cl ₂ produced, t/y | - | - | - | - | - | - |
| VCM production with mercury catalyst | N | | VCM produced, t/y | - | - | - | - | - | - |
| Acetaldehyde production with mercury catalyst | N | | Acetaldehyde produced, t/y | - | - | - | - | - | - |
| Production of products with mercury content | | | | | | | | | |
| Hg thermometers (medical, air, lab, industrial etc.) | N | | Mercury used for production, kg/y | - | - | - | - | - | - |
| Electrical switches and relays with mercury | N | | Mercury used for production, kg/y | - | - | - | - | - | - |
| Light sources with mercury (fluorescent, compact, others: see guideline) | N | | Mercury used for production, kg/y | - | - | - | - | - | - |
| Batteries with mercury | N | | Mercury used for production, kg/y | - | - | - | - | - | - |
| Manometers and gauges with mercury | N | | Mercury used for production, kg/y | - | - | - | - | - | - |
| Biocides and pesticides with mercury | N | | Mercury used for production, kg/y | - | - | - | - | - | - |
| Paints with mercury | N | | Mercury used for production, kg/y | - | - | - | - | - | - |
| Skin lightening creams and soaps with mercury chemicals | N | | Mercury used for production, kg/y | - | - | - | - | - | - |

Step4-Industrial Hg use Step5-Waste treatment+recycling Step6-Hg products-substances Step7-Crematoria-cemetaries Step8-Miscellaneous Hg sources

5.8 Waste incineration



**Incineration
of
municipal/
general
waste**



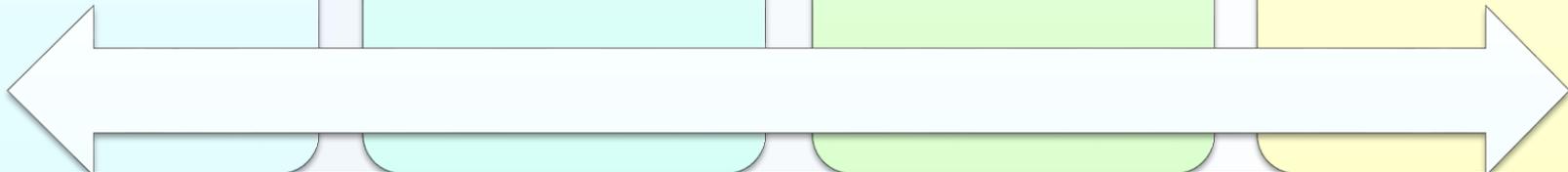
**Incineration
of
hazardous
waste**



**Incineration
of medical
waste**



**Informal
waste
incineration**



5.9 Waste deposition/landfilling and waste water treatment

Controlled landfills/deposits

Diffuse deposition under some control

Informal local disposal of industrial production waste

Informal dumping of general waste

Waste water system/treatment

Sources – Toolkit Level 1

Cemeteries

Potential hotspots

Sources – Toolkit Level 1

| Source category | Source present? Y/N/? |
|---|--------------------------|
| Waste incineration | |
| Incineration of municipal/general waste | N |
| Incineration of hazardous waste | Y |
| Incineration of medical waste | Y |
| Sewage sludge incineration | Y |
| Open fire waste burning (on landfills and informally) | N |
| Waste deposition/landfilling and waste water treatment | |
| Controlled landfills/deposits | Y |
| Informal dumping of general waste *1 | N |
| Waste water system/treatment | X |
| Crematoria and cemeteries | |
| Crematoria | N |
| Cemeteries | N |

Soubor Domů Vložení Rozložení stránky Vzorové Data Revize Zobrazení Acrobat

Vložit Vymout Kopírovat Kopírovat formát Schránka

Arial 10 Písmo

Zalamovat text Sloučit a zarovnat na střed Zarovnání

Obecný Číslo

Podmíněné formátování jako tabulku buňky Styly Vložit Od

B13 fx N

A B C D E

1 **GENERAL WASTE MANAGEMENT SET-UP IN THE COUNTRY**

2

3 **Please answer questions about the current waste treatment set-up in your country:** Y/N

4 a) Is more than 2/3 (two thirds = 67%) of the general waste collected and deposited on lined landfills or incinerated in closed incinerators? Y

b) Is more than 1/3 (one third = 33%) of the mercury-added products waste safely collected and treated separately? N

These 1 answer mercur calcula

6 **WASTE HANDLING AND RECYCLING**

7 **Source category** **Source present?** **Activity rate** **Unit** **Include Hg controls in estimation? (y/n)** **Estim input, Star est**

8 **Production of recycled of metals** Y/N/? **Annual production /waste disposal** **Unit** **Include Hg controls in estimation? (y/n)** **Star est**

9 Production of recycled mercury ("secondary production") ? Mercury produced, kg/y ?

10 Production of recycled ferrous metals (iron and steel) Y 14 645 Number of vehicles recycled/y

11

12 **Waste incineration**

13 Incineration of municipal/general waste N Waste incinerated, t/y -

Step1-Country data Step2-Energy Step3-Metals-RawMat Step4-Industrial Hg use Step5-Waste treatment+recycling Step6-Hg product

Připraven

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Vložit Vymout Kopírovat Kopírovat formát Schránka

Arial 10 Písmo

Zalamovat text Sloučit a zarovnat na střed Zarovnání

Obecný Číslo

Podmíněné formátování jako tabulku buňky Styly Vložit

| | A | B | C | D | E | |
|----|---|---|------------|--------------------------------|---|---|
| 16 | Incineration of hazardous waste | Y | 286 872 | Waste incinerated, t/y | Y | |
| 17 | | | | | Relevant pollution abatement options (guide: click white cells) | |
| 18 | | | | | Enter per cent of total activity rate per type: | |
| 19 | Incineration / burning of medical waste | Y | 11 973 | Waste incinerated, t/y | | |
| 20 | | | | | | |
| 21 | | | | | | |
| 22 | Sewage sludge incineration | Y | 30 453 | Waste incinerated, t/y | | |
| 23 | Open fire waste burning (on landfills and informally) | N | | Waste burned, t/y | | - |
| 24 | | | | | | |
| 25 | Waste deposition/landfilling and waste water treatment | | | | | |
| 26 | Controlled landfills/deposits | Y | 5 463 | Waste landfilled, t/y | | |
| 27 | Informal dumping of general waste *1 | ? | | Waste dumped, t/y | | ? |
| 28 | | | | | | |
| 29 | Waste water system/treatment | Y | 18 232 053 | Waste water, m ³ /y | | |

Sources – Toolkit Level 1

Production of recycled mercury ("secondary production")

?

Mercury produced, kg/y

Informal dumping of general waste *1

?

Waste dumped, t/y

Sources – Toolkit Level 1

| Source category | Source present? |
|--|-----------------|
| | Y/N/? |
| Use and disposal of products with mercury content | |
| Dental amalgam fillings ("silver" fillings) | Y |
| Preparations of fillings at dentist clinics | |
| Use - from fillings already in the mouth | |
| Disposal (excavations, lost and extracted teeth) | |
| Thermometers | Y |
| Medical Hg thermometers | Y |
| Other glass Hg thermometers (air, laboratory, dairy, etc.) | ? |
| Engine control Hg thermometers and other large industrial/ speciality Hg thermometers | ? |
| Electrical switches and relays with mercury | Y |
| Light sources with mercury | Y |
| Fluorescent tubes (double end) | Y |
| Compact fluorescent lamp (CFL single end) | ? |

Sources – Toolkit Level 1

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

| GENERAL CONSUMPTION OF MERCURY IN PRODUCTS, AS METAL MERCURY AND AS MERCURY CONTAINING SUBSTANCES | | | | | | | | | |
|---|-----------------|--------------------------------|--|---|---|--|---|------|--|
| Source category | Source present? | Activity rate | | | Estimated Hg input, Kg Hg/y | Estimated Hg | | | |
| | Y/N/? | Annual consumption /population | Unit | Include Hg controls in estimation? (y/n) | Standard estimate | Air | Water | | |
| Use and disposal of products with mercury content | | | | | NOTE: Selection regarding waste management: | More than 2/3 (two thirds; 67%) of the | | | |
| <i>Dental amalgam fillings ("silver" fillings)</i> | Y | | | | 4 711 | 94,2 | 2 073,0 | 376, | |
| Preparations of fillings at dentist clinics | | 81 000 000 | Number of inhabitants | | | 94,2 | 659,6 | | |
| Use - from fillings already in the mouth | | 81 000 000 | Number of inhabitants | | | 0,0 | 94,2 | | |
| Disposal (excavations, lost and extracted teeth) | | 81 000 000 | Number of inhabitants | | | 0,0 | 1 319,2 | | |
| | | 0,241 | Number of dental personnel per 1000 inhab. | | | | | | |
| | | | | Relevant pollution abatement options (guide: click white cells) | | Clinics where only simple chair strainers/filters are used | Clinics where high efficiency amalgam separators are used | | |
| | | | | Enter per cent of total activity rate per type: | | 100 | | | |
| <i>Thermometers</i> | Y | 24 151 | | | 24 | 2,4 | 7,2 | | |
| Medical Hg thermometers | Y | 24 151 | Items sold/y | | 24 | | | | |
| Other glass Hg thermometers (air laboratory | | | | | | | | | |

Step4-Industrial Hg use / Step5-Waste treatment+recycling / **Step6-Hg products-substances** / Step7-Crematoria-cemetaries / Step8-Miscellaneous Hg sources

Sources – Toolkit Level 1

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

Formula bar: C15 =SUMA(C16:C18)

| | A | B | C | D | E | F | G | H |
|----|--|----------|------------------|---------------------------|---|--------|------------|------------|
| 15 | Thermometers | Y | 24 151 | | | 24 | 2,4 | 7,2 |
| 16 | Medical Hg thermometers | Y | 24 151 | Items sold/y | | 24 | | |
| 17 | Other glass Hg thermometers (air, laboratory, dairy, etc.) | ? | | Items sold/y | | ? | | |
| 18 | Engine control Hg thermometers and other large industrial/speciality Hg thermometers | ? | | Items sold/y | | ? | | |
| 19 | | | | | | | | |
| 20 | Electrical switches and relays with mercury | Y | 81 000 000 | Number of inhabitants | | 11 329 | 1 132,9 | 0,0 |
| 21 | | | 100 | electricification rate, % | | | | |
| 22 | | | | | | | | |
| 23 | Light sources with mercury | Y | 1 816 880 | Items sold/y | | 45 | 2,3 | 0,0 |
| 24 | Fluorescent tubes (double end) | Y | 1 816 880 | Items sold/y | | 45 | | |
| 25 | Compact fluorescent lamp (CFL single end) | ? | | Items sold/y | | ? | | |
| 26 | Other Hg containing light sources (see guideline) | ? | | Items sold/y | | ? | | |
| 27 | | | | | | | | |
| 28 | Batteries with mercury | Y | 0 | t batteries sold/y | | 78 | 0,0 | 0,0 |
| 29 | Mercury oxide (button cells and other sizes); also called mercury-zinc cells | Y | 0 | Batteries sold, t/y | | 78 | | |
| 30 | Other button cells (zinc-air, alkaline button cells, silver-oxide) | ? | | Batteries sold, t/y | | ? | | |
| 31 | Other batteries with mercury (plain cylindrical alkaline, permanganate, etc., see guideline) | ? | | Batteries sold, t/y | | ? | | |
| 32 | | | | | | | | |
| 33 | Polyurethane (PU, PUR) produced with mercury catalyst | ? | 81 000 000 | Number of inhabitants | | ? | ? | ? |
| 34 | | | 100 | Electricification rate, % | | | | |

Navigation: Step4-Industrial Hg use / Step5-Waste treatment+recycling / **Step6-Hg products-substances** / Step7-Crematoria-cemetaries / Step8-Miscellannous Hg sources

System tray: 19:10, 19.06.2018

Sources – Toolkit Level 1

| Source category | Source present? |
|--|-----------------|
| | Y/N/? |
| Compact fluorescent lamp (CFL single end) | ? |
| Other Hg containing light sources (see guideline) | ? |
| Batteries with mercury | Y |
| Mercury oxide (button cells and other sizes); also called mercury-zinc cells | Y |
| Other button cells (zinc-air, alkaline button cells, silver-oxide) | ? |
| Other batteries with mercury (plain cylindrical alkaline, permanganate, etc., see guideline) | ? |
| Polyurethane (PU, PUR) produced with mercury catalyst | ? |
| Paints with mercury preservatives | ? |
| Skin lightening creams and soaps with mercury chemicals | ? |
| Medical blood pressure gauges (mercury sphygmomanometers) | Y |
| Other manometers and gauges with mercury | Y |
| Laboratory chemicals | Y |
| Other laboratory and medical equipment with mercury | Y |

Sources – Toolkit Level 1

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

Soubor Domů Vložení Rozložení stránky Vzorce Data Revize Zobrazení Acrobat

Vložit Vymout Kopírovat Kopírovat formát Schránka Písmo Zarovnání Číslo Podmíněné formátování jako tabulku Styly Vložit Odstranit Formát Buňky Úpravy

Automatické shrnutí Vyplnit Vymazat Seřadit a filtrovat Najít a vybrat

C15 =SUMA(C16:C18)

| | A | B | C | D | E | F | G | H | I |
|----|---|---|------------|---------------------------|---|-------|------|---------|---|
| 36 | Paints with mercury preservatives | ? | | Paint sold, t/y | | ? | ? | ? | ? |
| 37 | | | | | | | | | |
| 38 | Skin lightening creams and soaps with mercury chemicals | ? | | Cream or soap sold, t/y | | ? | ? | ? | ? |
| 39 | | | | | | | | | |
| 40 | Medical blood pressure gauges (mercury sphygmomanometers) | Y | | Items sold/y | | 0 | 0,0 | 0,0 | |
| 41 | | | | | | | | | |
| 42 | Other manometers and gauges with mercury | Y | 81 000 000 | Number of inhabitants | | 405 | 40,5 | 121,4 | |
| 43 | | | 100 | Electricification rate, % | | | | | |
| 44 | | | | | | | | | |
| 45 | Laboratory chemicals | Y | 81 000 000 | Number of inhabitants | | 809 | 0,0 | 267,0 | |
| 46 | | | 100 | Electricification rate, % | | | | | |
| 47 | | | | | | | | | |
| 48 | Other laboratory and medical equipment with mercury | Y | 81 000 000 | Number of inhabitants | | 3 237 | 0,0 | 1 068,1 | |
| 49 | | | 100 | Electricification rate, % | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |

Step4-Industrial Hg use Step5-Waste treatment+recycling Step6-Hg products-substances Step7-Crematoria-cemetaries Step8-Miscellannous Hg sources

Sources – Toolkit Level 1

| Source category | Source present? |
|---|-----------------|
| | Y/N/? |
| Combustion of oil shale | N |
| Combustion of peat | N |
| Geothermal power production | N |
| Production of other recycled metals | N |
| Production of lime | Y |
| Production of light weight aggregates (burnt clay nuts for building purposes) | N |
| Chloride and potassium hydroxide produced from mercury-cell technology | N |
| Polyurethane production with mercury catalysts | N |
| Seed dressing with mercury chemicals | N |
| Infra red detection semiconductors | N |

Sources – Toolkit Level 1

| Source category | Source present? |
|--|-----------------|
| | Y/N/? |
| Bougie tubes and Cantor tubes (medical) | N |
| Educational uses | Y |
| Gyroscopes with mercury | N |
| Vacuum pumps with mercury | N |
| Mercury used in religious rituals (amulets and other uses) | N |
| Mercury used in traditional medicines (ayurvedic and others) and homeopathic medicine | N |
| Use of mercury as a refrigerant in certain cooling systems | N |
| Light houses (levelling bearings in marine navigation lights) | N |
| Mercury in large bearings of rotating mechanic parts in for example older waste water treatment plants | N |
| Tanning | N |

Sources – Toolkit Level 1

| Source category | Source present? |
|---|-----------------|
| | Y/N/? |
| Pigments | Y |
| Products for browning and etching steel | N |
| Certain colour photograph paper types | N |
| Recoil softeners in rifles | ? |
| Explosives (mercury-fulminate a.o.) | ? |
| Fireworks | ? |
| Executive toys | ? |

Inventory Level 1 – Summary (draft)

Hg-Toolkit-Inventory Level 1-Calculation-Spreadshee_Turkey.xlsx - Microsoft Excel

| INVENTORY LEVEL 1 - EXECUTIVE SUMMARY | | | | | | | | | | |
|--|-----------------------------|--|--------------|--------------|----------------------------|---------------|---|---------------|-----------------------|--------------------------------|
| Source category | Estimated Hg input, Kg Hg/y | Estimated Hg releases, standard estimates, Kg Hg/y | | | | | | | Total releases *3*4*5 | Percent of total releases *3*4 |
| | | Air | Water | Land | By-products and impurities | General waste | Sector specific waste treatment /disposal | | | |
| Coal combustion and other coal use | 15 126,9 | 13 049,5 | 0,0 | 0,0 | 0,0 | 0,0 | 2 077,4 | 15 127 | 21% | |
| Other fossil fuel and biomass combustion | 5 937,7 | 5 937,2 | 0,0 | 0,0 | 0,0 | 0,0 | 0,5 | 5 938 | 8% | |
| Oil and gas production | 146,1 | 30,7 | 10,1 | 0,0 | 11,0 | 0,0 | 27,9 | 80 | 0% | |
| Primary metal production (excl. gold production by amalgamation) | 12 198,7 | 1 670,2 | 253,4 | 0,0 | 4 803,3 | 160,6 | 5 311,2 | 12 199 | 17% | |
| Gold extraction with mercury amalgamation | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0 | 0% | |
| Other materials production*6 | 10 160,3 | 7 112,2 | 0,0 | 0,0 | 3 048,1 | 0,0 | 0,0 | 10 160 | 14% | |
| Chlor-alkali production with mercury-cells | - | - | - | - | - | - | - | 0 | 0% | |
| Other production of chemicals and polymers | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0 | 0% | |
| Production of products with mercury content*1 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0 | 0% | |
| Application, use and disposal of dental amalgam fillings | 4 711,4 | 94,2 | 2 073,0 | 376,9 | 282,7 | 942,3 | 942,3 | 4 711 | 7% | |
| Use and disposal of other products | 15 927,2 | 1 178,0 | 1 463,8 | 1 132,9 | 0,0 | 10 776,9 | 1 375,6 | 15 927 | 22% | |
| Production of recycled metals | 16,1 | 5,3 | 0,0 | 5,5 | 0,0 | 5,3 | 0,0 | 16 | 0% | |
| Waste incineration and open waste burning*2 | 7 233,2 | 6 538,6 | 0,0 | 0,0 | 0,0 | 0,0 | 694,6 | 7 233 | 10% | |
| Waste deposition*2 | 27,3 | 0,3 | 0,0 | 0,0 | - | - | - | 0 | 0% | |
| Informal dumping of general waste *2*3 | ? | ? | ? | ? | ? | ? | ? | 0 | 0% | |
| Waste water system/treatment *4 | 95,7 | 0,0 | 86,1 | 0,0 | 0,0 | 9,6 | 0,0 | 10 | 0% | |
| Crematoria and cemeteries | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0 | 0% | |
| TOTALS (rounded) *1*2*3*4*5*6 | 64 880 | 35 620 | 3 800 | 1 520 | 8 150 | 11 890 | 10 430 | 71 400 | 100% | |

Notes:
 *1 To avoid double counting of mercury in products produced domestically and sold on the domestic market (including oil and gas), only the part of mercury inputs *released* from production are included in the input TOTAL.
 *2: To avoid double counting of mercury inputs from waste and products in the input TOTAL, only 10% of the mercury input to waste incineration, waste deposition and

Step6-Hg products-substances / Step7-Crematoria-cemeteries / Step8-Miscellaneous Hg sources / Insert IL2 results / Unit conversion / Level 1-ExecSummary

Toolkit for Identification and Quantification of Mercury Releases Reference Report and Guideline for Inventory Level 2 Version 1.4 January 2017



Introduction to the Inventory Level 2 concept

The Toolkit's Inventory Level 2 consists of a four-step standardized procedure to develop consistent and comparable source inventories.

The recommended **four-step approach** used to establish a national mercury release inventory using the Toolkit

ESTABLISHING A NATIONAL MERCURY RELEASE INVENTORY USING THIS TOOLKIT

STEP 1 - Apply screening matrix to identify main source categories present in the country or region investigated and identify existing descriptions of mercury sources in the country;

STEP 2 - Classify main source categories further into sub-categories and gather additional qualitative information to identify existing activities and sources of mercury releases in the country; and if feasible, the relative importance of each;

STEP 3 - Gather detailed quantitative information on the identified sources, and quantify releases with source specific data or default mercury input and output distribution factors from this Toolkit;

STEP 4 - Apply nation-wide to establish full inventory and report results using guidance given in the standard format.



Teşekkür Ederim

