

Supplement of Atmos. Chem. Phys., 16, 12495–12511, 2016  
<http://www.atmos-chem-phys.net/16/12495/2016/>  
doi:10.5194/acp-16-12495-2016-supplement  
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Atmospheric  
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*Supplement of*

## **Current and future levels of mercury atmospheric pollution on a global scale**

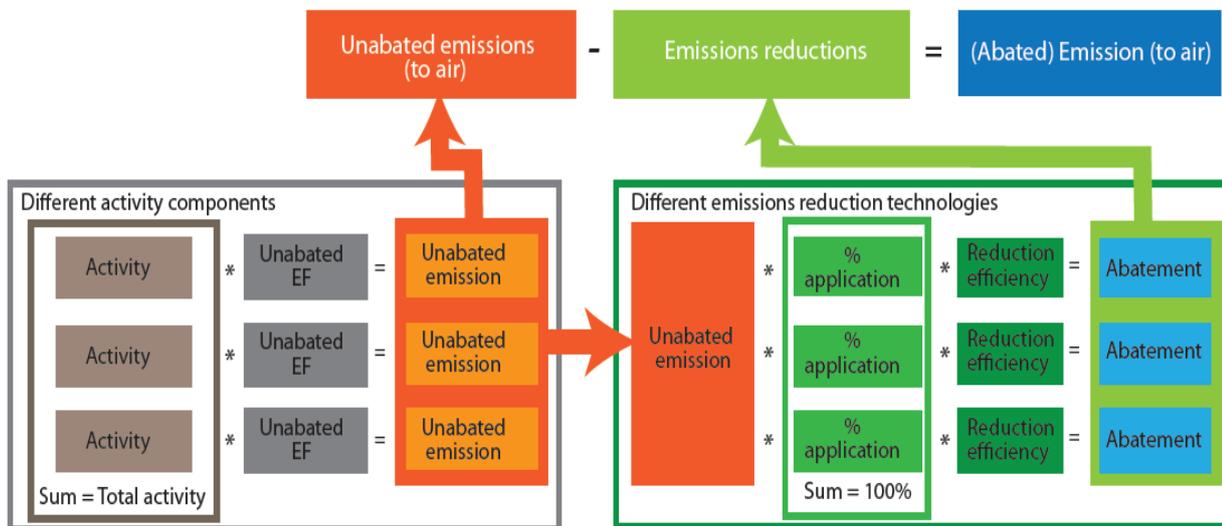
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**Conceptual approach used to produce emission inventories:**

The conceptual approach used to produce emission inventories developed in AMAP/UNEP (2013) is presented in Fig. S1 below.

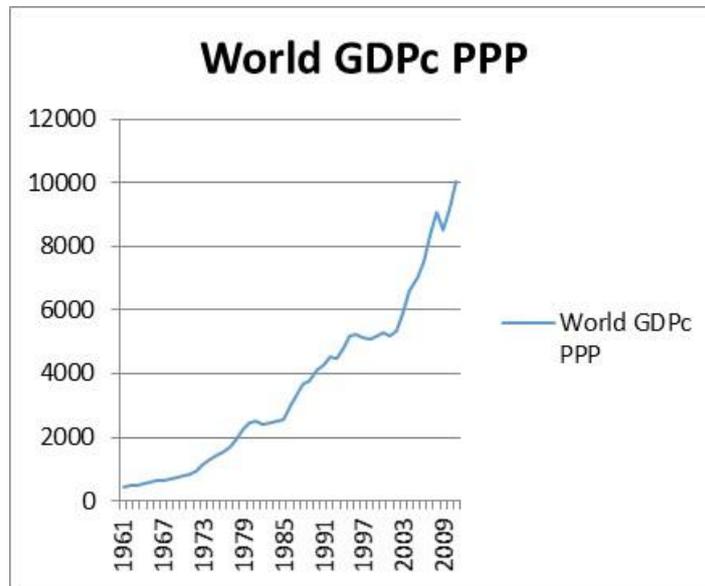


5 **Figure S1: Methodology for 2010 emission inventory (from AMAP/UNEP, 2013).**

**Future economic activities:**

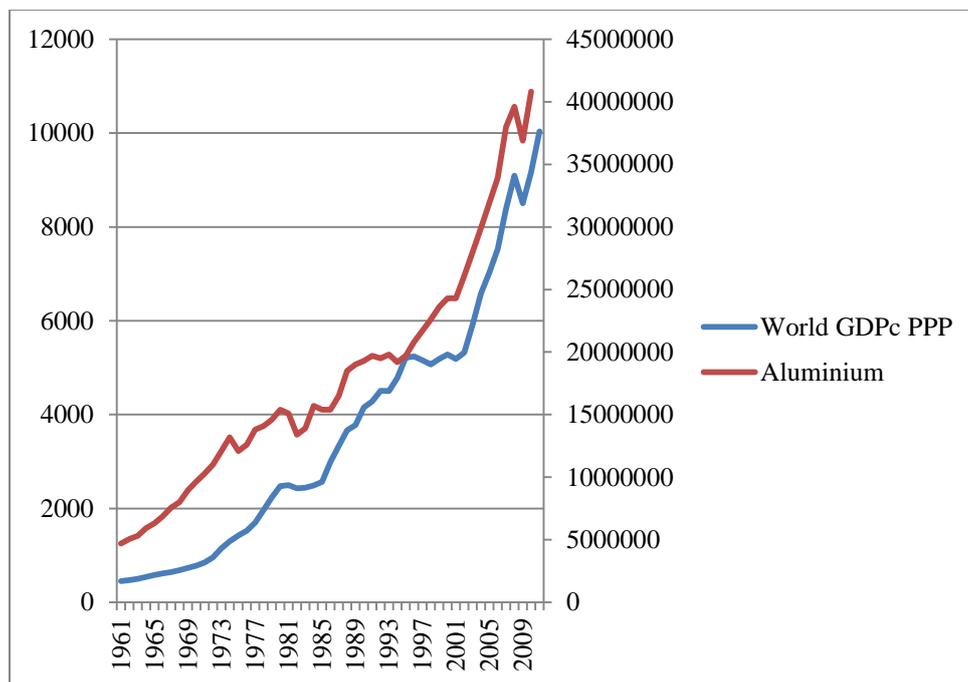
Projections on economic activities was estimated on the basis of forecasting production of metal or cement on the expectations of development of GDP per capita PPP in various countries presented in the OECD database (for the year 2035) as well as the IMF expectations (until the year 2017). The model estimated the future economic activities that equals the levels of change in consumption -assuming that the global markets for metals and cement are in balance. The model does however, not account for potential changes in international or interregional trade patterns.

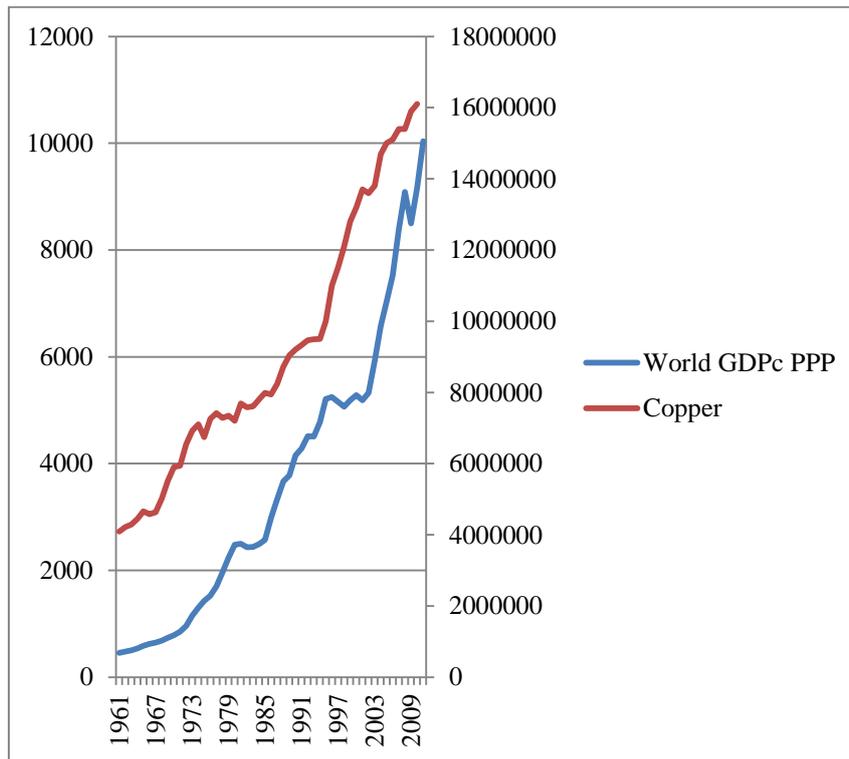
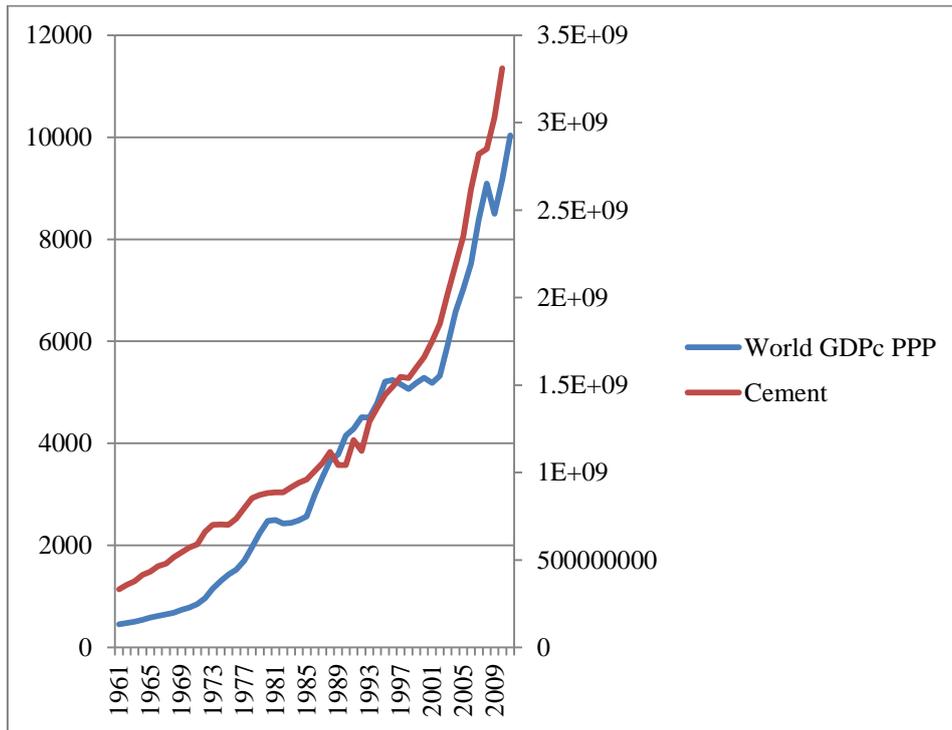
The GDP per capita adjusted for purchase power parity (PPP) indicates the country`s standard of living, adjusted for the relative value of currencies. With the exception of the economic recession in 2007-2008, the global level of GDP per capita PPP has constantly increased over time. The World Bank statistics for GDP per capita, adjusted for ppp (2005 international dollar) in the period 1961-2010 is presented in Fig. S2 below.

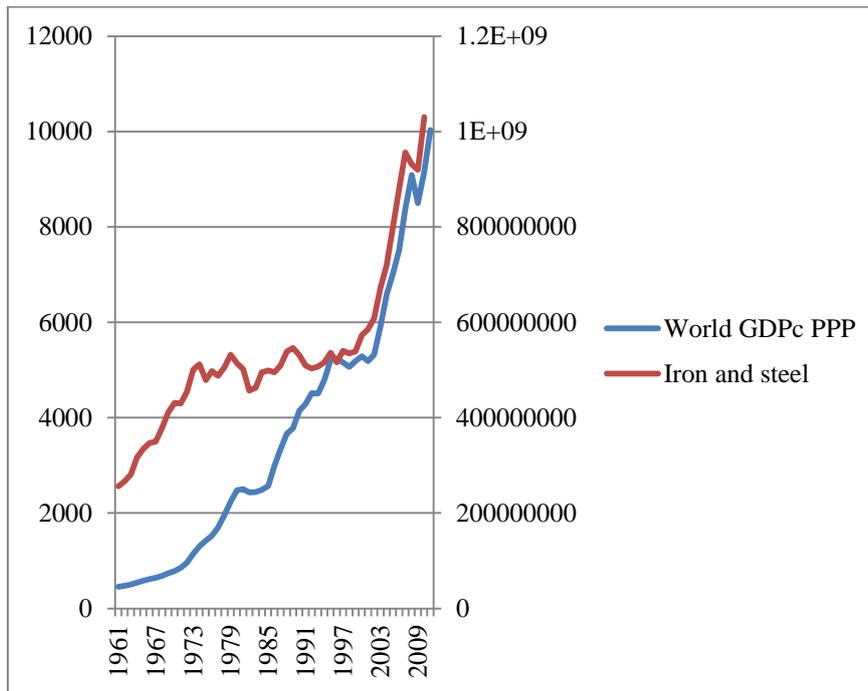


**Figure S2: The World Bank statistics for GDP per capita, adjusted for ppp (2005 international dollar) in the period 1961-2010.**

The last 5 decades, the global industrial production of goods has correlated well with developments in world GDP per capita PPP, which can be observed for the case of aluminum, cement, copper and steel in fig. S3 below. Less correlation can be expected for mercury, gold and lead due to heavy dependency on market regulations, and raw material prices.



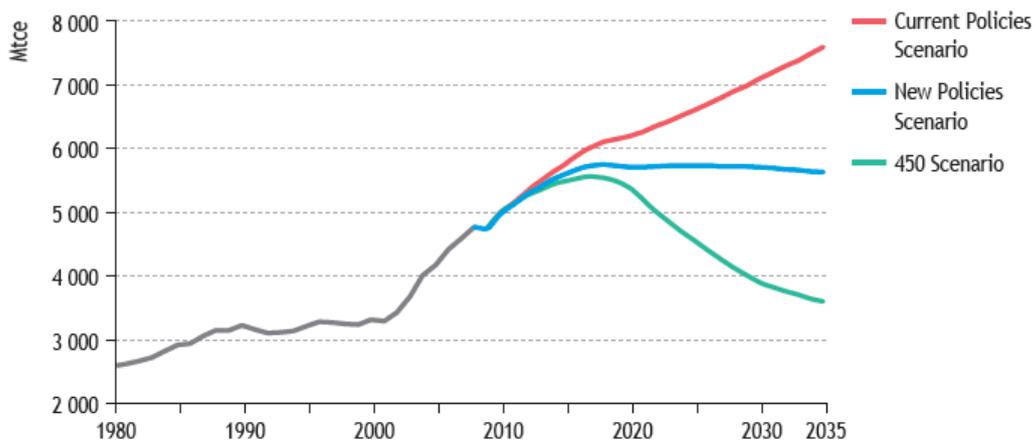




**Figure S3: Correlation of industrial production (left y-axis) and GDP per capita adjusted for purchase power parity (right y-axis) over the years 1961-2009.**

**Coal use assumed under the IEA WEO future scenario assumptions:**

- 5 Coal use is assumed to be critically influenced by government policies related to climate change. This can be observed in Fig. S4



\*Includes hard coal (steam and coking coal), brown coal (lignite) and peat.

**Figure S4: Coal use assumed under the future scenario assumptions (figure from WEO, 2011).**

### Future consumption of mercury-containing products:

Table S1. Consumption (t) based on UNEP status quo 2015 + annual relative change (equivalent to annual change 2005-2010) extrapolated to 2035. (Basis for the Current Policies scenario, CP).

UNEP status quo 2015 + annual relative change (equivalent to change 2005-2010) extrapolated to 2035	Batteries	Measuring devices	Lamps	Electrical	Other	Total
East and Southeast Asia	70.4	23.5	43.0	20.5	41.7	199
South Asia	9.7	6.4	16.9	11.8	15.6	60
European Union (27 countries)	8.8	4.7	14.0	0.5	78.3	106
CIS and other European countries	2.4	3.6	6.3	5.0	7.6	25
Middle Eastern States	1.8	3.3	7.2	3.6	4.4	20
North Africa	0.7	1.4	2.0	3.1	1.2	8
Sub-Saharan Africa	1.5	2.1	5.3	4.2	4.3	17
North America excl. Mexico	4.2	8.1	12.5	14.6	55.3	95
Central America and the Caribbean	1.5	2.6	4.0	2.4	4.7	15
South America	5.9	4.2	19.7	4.5	9.6	44
Australia New Zealand and Oceania	0.7	0.9	2.0	2.6	1.2	7
<b>TOTAL</b>	<b>108</b>	<b>61</b>	<b>133</b>	<b>73</b>	<b>224</b>	<b>598</b>
<b>% change in consumption compared to 2010</b>	<b>-63%</b>	<b>-76%</b>	<b>8%</b>	<b>-54%</b>	<b>-27%</b>	<b>-47%</b>

**Table S2. Consumption (t) calculated based on UNEP partnership target 2015 + annual relative change (equivalent to relative annual change 2005-2010) extrapolated to 2030. (Basis for the New Policies scenario, NP)**

<b>UNEP partnership target 2015 + annual relative change (2005-2010) to 2035. <u>Consumption</u></b>	<b>Batteries</b>	<b>Measuring devices</b>	<b>Lamps</b>	<b>Electrical</b>	<b>Other</b>	<b>Total</b>
East and Southeast Asia	17.6	9.4	35.3	9.3	36.8	108
South Asia	2.4	2.5	13.9	5.4	13.8	38
European Union (27 countries)	2.2	1.9	11.5	0.2	69.1	85
CIS and other European countries	0.6	1.4	5.1	2.3	6.7	16
Middle Eastern States	0.4	1.3	5.9	1.6	3.9	13
North Africa	0.2	0.5	1.6	1.4	1.0	5
Sub-Saharan Africa	0.4	0.8	4.4	1.9	3.8	11
North America excl. Mexico	1.1	3.2	10.3	6.6	48.8	70
Central America and the Caribbean	0.4	1.0	3.3	1.1	4.1	10
South America	1.5	1.7	16.2	2.0	8.5	30
Australia New Zealand and Oceania	0.2	0.4	1.6	1.2	1.0	4
<b>TOTAL</b>	<b>27</b>	<b>24</b>	<b>109</b>	<b>33</b>	<b>197</b>	<b>391</b>
<b>% change in consumption compared to 2010</b>	<b>-91%</b>	<b>-90%</b>	<b>-11%</b>	<b>-79%</b>	<b>-35%</b>	<b>-65%</b>

**Table S3. Consumption of mercury (t) in mercury-added products in 2030 assuming a 95% decrease compared to the average in 2010.**

<b>MFR=5% of 2010 average consumption (t)</b>						
<b>World region</b>	Batteries	Meas. control devices	Lighting	Electrical devices	Other	Sum
East and Southeast Asia	9.6	4.9	2.1	2.5	2.8	21.9
South Asia	1.3	1.4	0.7	0.9	1.05	5.3
European Union (25 countries)	1.1	0.8	0.9	0.1	5.3	8.1
CIS and other European countries	0.4	0.8	0.4	0.5	0.6	2.7
Middle Eastern States	0.3	0.7	0.3	0.4	0.3	1.9
North Africa	0.1	0.25	0.1	0.2	0.1	0.8
Sub-Saharan Africa	0.2	0.45	0.2	0.3	0.25	1.4
North America	0.6	1.7	0.8	2.2	3.8	9.0
Central America and the Caribbean	0.2	0.5	0.2	0.3	0.4	1.5
South America	0.8	0.9	0.5	0.5	0.7	3.4
Australia New Zealand and Oceania	0.1	0.2	0.1	0.15	0.1	0.7
<b>TOTAL (t)</b>	<b>14.6</b>	<b>12.5</b>	<b>6.2</b>	<b>7.9</b>	<b>15.3</b>	<b>56.4</b>