

Expert judgement – Carbotech 2023a

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Cited as	Carbotech 2023a
Date	27. December 2023
Topic	2C4 Magnesium production: Uncertainty SF6 emissions
Name of expert(s) involved	Cornelia Stettler, Carbotech AG
Experts' background (references, roles, etc.)	F-Gas model calculations 2001 to 2023 (since 2008 project lead, in former years collaboration in data acquisition)
The quantity being judged (AD, EF of what?)	<p>Uncertainty of emissions 1990-2006, expert estimations for the given uncertainty considering quality of activity data AD and emission factors EF used in model calculations of SF6 emissions of Magnesium factories</p> <p>Emissions = AD * EF</p> <p>AD = SF6 consumption (based on import declarations SF6 allocated to the Magnesium industry, average of the present and former year used for consumption in model calculations)</p> <p>EF = 100% loss (no recovery, no transformation)</p>
The logical basis for judgement, including any data taken into consideration. This should include the rationale for the high end, low end, and central tendency of any uncertainty distribution.	<p>The uncertainty of AD is assumed medium to high 20-30% due to the applied allocation and timing between years.</p> <p>The conservative approach for the EF with a complete loss is assumed accurate (no recovery and only low variation expected from a possible transformation quote). The uncertainty of EF is assumed <5%</p>
The result: e.g., activity value, emission factor or for uncertainty the probability distribution, or the range and most likely value and the probability distribution subsequently inferred.	The so far applied estimate value of 27.7% uncertainty is assumed adequate for the reporting NID (combined uncertainty 25.5% with 5% for EF and 25% for AD)
Identification of any external reviewers	Stefan Reimann, Empa (during internal review, March 2024)
Attachments (file names)	none
Approval by QA/QC officer specifying date and person	Michael Bock,

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Date	27. December 2023
Topic	2C3 Aluminium production: Uncertainty PFC emissions
Name of expert(s) involved	Cornelia Stettler, Carbotech AG
Experts' background (references, roles, etc.)	F-Gas model calculations 2001 to 2023 (since 2008 project lead, in former years collaboration in data acquisition)
The quantity being judged (AD, EF of what?)	<p>Uncertainty of emissions 1990-2006, expert estimations for the given uncertainty considering quality of activity data AD and emission factors EF used in model calculations of PFC emissions</p> <p>Emissions = AD * EF</p> <p>AD = Aluminium production (total amount of Aluminium production in t, available for different production sites / statistics on Aluminium industry from Switzerland)</p> <p>EF = PFC emission per ton of Aluminium (CF4 and C2F6), Swiss reduction path partly based on company specific values and measurements, extrapolations considering development of technology applied.</p>
The logical basis for judgement, including any data taken into consideration. This should include the rationale for the high end, low end, and central tendency of any uncertainty distribution.	<p>The uncertainty of AD is assumed low with statistics on aluminium production of Swiss industry (<5%).</p> <p>The original EF applied 1990 corresponds to the average of industry before the use of modern Point-Fed Prebake PFPBm and lies in the size of emissions given for HSS. IPCC indicates uncertainty of HSS (-79% / +112%)</p> <p>The reduction path for the EF is assumed plausible due to the PFPBm technology applied in Switzerland, IPCC defines for PFPBm uncertainty ranges (-90%/+213%)</p>
The result: e.g., activity value, emission factor or for uncertainty the probability distribution, or the range and most likely value and the probability distribution subsequently inferred.	We suggest to replace the so far applied uncertainty of 9 % adequate for continuous measurement with IPCC uncertainty ranges of technologies HSS for 1990 (-79%/+112%) and PFPBm for 2006 (-90%/+213%).
Identification of any external reviewers	Stefan Reimann, Empa (during internal review, March 2024)
Attachments (file names)	none
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