

Discussion paper – Black carbon methodology for waste incineration (6C)

Waste incineration consists of five chapters in the GB:

- Clinical waste incineration
- Industrial waste incineration
- Municipal waste incineration
- Cremation
- Small-scale waste burning

The chapters are very different in nature. Clinical, industrial and municipal waste incineration will be considered jointly in one section. Cremations, which cover the incineration of corpses and carcasses, are described in a separate section. The chapter on small-scale waste burning consists of EFs for burning of agricultural crops (not field burning); these sources will also be discussed in a separate section.

Waste incineration

There is generally little information available regarding BC emissions from waste incineration. The table below lists the available EFs for BC.

	Mugica et al.		Olmez et al.		Pinto et al.	Speciate		
	Biological waste % of PM _{2.5}	Municipal waste % of PM _{2.5}	Municipal waste % of PM _{2.5}	% in coarse particles (2.5<PM<10)	Clinical waste % of PM _{2.5}	Municipal waste % of PM _{2.5}		
EC	1,15	6,98	3,5	2,3	18	1,52	2,42	3,5
OC	69,18	64,28			56	8,41	13,37	0,57
Volatile C			0,57	2,5				

The value reported by Pinto et al. seems to be an outlier compared to the other available references. The BC share of PM_{2.5} reported by Mugica et al., Olmez et al. and the three available datasets in the Speciate database are generally in good agreement.

Recommendation

Based on the limited data available it is proposed that a BC share of 3.5 % of PM_{2.5} is used in the GB for clinical, industrial and municipal waste incineration. The reference in the GB will be to Olmez et al.

Cremation

No data were found for cremation of human bodies and animal carcasses. This will be a very small source of BC emissions. It is recommended that BC is listed as NE in the EF tables.

Small-scale waste burning

Small-scale waste burning as in the current GB consists of a tier 1 EF table, and tier 2 EFs for leaf burning, forest residues, orchard crops, weeds, vine crops, backfire burning and headfire burning.

In the current GB chapter there is EFs for NMVOC, NH₃, TSP, PM₁₀, PM_{2.5}, PCDD/F and total PAH. However, when reviewing the EFs, the following observations are made: the EFs provided for NMVOC, NH₃, PCDD/F and total PAH are identical for tier 1 and all available tier 2 tables.

The TSP EFs are from a previous version of the GB and are not referenced. The calculation of PM₁₀ and PM_{2.5} is based on particle size distribution from crude oil plumes!

Furthermore, the tier 1 TSP EF is lower than all of the tier 2 TSP EF.

It is difficult to defend the current level of disaggregation considering that the only EFs that vary across the different tier 2 EF tables are PM and that these factors are not referenced.

Recommendation

It is proposed to use data by Jenkins et al. (1996) to develop EFs for forest residues (Douglas fir slash & Ponderosa pine slash) and orchard crops (Almond prunings & Walnut prunings). The detailed data by Jenkins et al. also includes information on EC, which is proposed to be used for BC EFs in the GB.

References

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