1 Supplementary material

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3 Table S1. Lognormal parameterizations of the modeled average particle number size

4 distributions downwind Malmö (Fig. 4a). The parameterization was carried out with the

Parameter	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
D _p (nm)	7.60	18.8	47.9	106	303
σ	1.43	1.32	1.54	1.77	1.32
$PN (cm^{-3})$	2237	798.3	2072	2018	88.11
D _p (nm)	9.98	31.2	76.8	213	-
σ	1.43	1.60	1.60	1.52	-
PN (cm ⁻³)	1134	1437	2435	528	-
D _p (nm)	10.0	25.9	62.6	134.9	346
σ	1.35	1.60	1.43	1.683	1.27
$PN (cm^{-3})$	512.4	1266	1629	1376	36.87
D _p (nm)	10.0	25.871	62.6	134.9	346
σ	1.35	1.60	1.43	1.68	1.35
PN (cm ⁻³)	301.5	1146	1531	1368	43.2
D _p (nm)	9.30	26.9	66.2	150.2	327
σ	1.18	1.93	1.52	1.68	1.35
PN (cm ⁻³)	1329	47.53	1581	1070	29.66
D _p (nm)	18.5	31.1	64.7	148.4	309
σ	1.66	1.32	1.54	1.66	1.43
PN (cm ⁻³)	212.1	631.9	1895	960.8	92.73
	Parameter D_p (nm) σ PN (cm ⁻³) P_p (nm) σ PN (cm ⁻³)	ParameterMode 1 D_p (nm)7.60 σ 1.43 PN (cm ⁻³)2237 D_p (nm)9.98 σ 1.43 PN (cm ⁻³)1134 D_p (nm)10.0 σ 1.35 PN (cm ⁻³)512.4 D_p (nm)10.0 σ 1.35 PN (cm ⁻³)301.5 D_p (nm)9.30 σ 1.18 PN (cm ⁻³)1329 D_p (nm)18.5 σ 1.66 PN (cm ⁻³)212.1	ParameterMode 1Mode 2 D_p (nm)7.6018.8 $σ$ 1.431.32PN (cm ⁻³)2237798.3 D_p (nm)9.9831.2 $σ$ 1.431.60PN (cm ⁻³)11341437 D_p (nm)10.025.9 $σ$ 1.351.60PN (cm ⁻³)512.41266 D_p (nm)10.025.871 $σ$ 1.351.60PN (cm ⁻³)301.51146 D_p (nm)9.3026.9 $σ$ 1.181.93PN (cm ⁻³)132947.53 D_p (nm)18.531.1 $σ$ 1.661.32PN (cm ⁻³)212.1631.9	ParameterMode 1Mode 2Mode 3 D_p (nm)7.6018.847.9 $σ$ 1.431.321.54PN (cm ⁻³)2237798.32072 D_p (nm)9.9831.276.8 $σ$ 1.431.601.60PN (cm ⁻³)113414372435 D_p (nm)10.025.962.6 $σ$ 1.351.601.43PN (cm ⁻³)512.412661629 D_p (nm)10.025.87162.6 $σ$ 1.351.601.43PN (cm ⁻³)301.511461531 D_p (nm)9.3026.966.2 $σ$ 1.181.931.52PN (cm ⁻³)132947.531581 D_p (nm)18.531.164.7 $σ$ 1.661.321.54PN (cm ⁻³)212.1631.91895	ParameterMode 1Mode 2Mode 3Mode 4 D_p (nm)7.6018.847.9106σ1.431.321.541.77PN (cm ⁻³)2237798.320722018 D_p (nm)9.9831.276.8213σ1.431.601.601.52PN (cm ⁻³)113414372435528 D_p (nm)10.025.962.6134.9σ1.351.601.431.683PN (cm ⁻³)512.4126616291376 D_p (nm)10.025.87162.6134.9σ1.351.601.431.68PN (cm ⁻³)301.5114615311368 D_p (nm)9.3026.966.2150.2σ1.181.931.521.68PN (cm ⁻³)132947.5315811070 D_p (nm)18.531.164.7148.4σ1.661.321.541.66PN (cm ⁻³)212.1631.91895960.8

5 DO-FIT algorithm from Hussein et al. (2005).

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Table S2. Lognormal parameterizations of the modeled median particle number size
 distributions downwind Malmö (Fig. 4b).). The parameterization was carried out with
 the DO-FIT algorithm from Hussein et al. (2005).

Location	Parameter	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
Malmö	D _p (nm)	10.4	18.5	55.4	130	286
	σ	1.32	1.99	1.66	1.66	1.21
	$PN (cm^{-3})$	143.3	931.5	2294	1052	66.23
10 km dw. M	D _p (nm)	11.2	20.4	56.6	127	265
	σ	1.32	1.88	1.66	1.66	1.32
	$PN (cm^{-3})$	134.3	644.6	2166.3	993.1	88.57
20 km dw. M	D _p (nm)	9.30	21.6	54.2	111.5	265.4
	σ	1.10	1.77	1.43	1.66	1.43
	$PN (cm^{-3})$	17.91	858.0	1269	1512	99.29
30 km dw. M	D _p (nm)	11.2	35.5	63.3	122	265
	σ	1.43	1.66	1.43	1.66	1.43
	$PN (cm^{-3})$	150.5	1098	955.0	1229	113.3
40 km dw. M	D _p (nm)	9.30	21.6	51.8	106	303
	σ	1.43	1.66	1.54	1.77	1.32
	$PN (cm^{-3})$	25.50	408.1	1245	1584	1584
50 km dw. M	D _p (nm)	10.4	24.4	59.9	120	271
	σ	1.35	1.77	1.68	1.77	1.35
	PN (cm ⁻³)	14.81	370.3	1679	1020	107.1



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Figure S1. The average background particle number size distribution at Vavihill (50 km downwind Malmö) derived from the modeling of the air mass transport between upwind Malmö and Vavihill (dashed line). The air has not passed Malmö city during this transport. Average upwind Malmö conditions are approximated with Vavihill DMPS size distribution data and denoted with a continuous line.

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Figure S2. Wind rose from the meteorological mast in Malmö displaying the winddirection distribution from 2005 to 2009.

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5 References

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7 Kulmala M. Evaluation of an automatic algorith for fitting the particle number size

8 distributions. Boreal Environment Research, 10, 337-355, 2005.