

**AIR POLLUTANT EMISSIONS IN FINLAND  
1990–2017**

**INFORMATIVE INVENTORY REPORT**

to the Secretariat of the UNECE  
Convention on Long-Range Transboundary Air Pollution

**PART 7 ANNEXES**

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**FINNISH ENVIRONMENT INSTITUTE**

Centre for Sustainable Consumption and Production  
Environmental Management in Industry – Air Emissions Team



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## **Annex 1**

### **Implied emission factor tables for fuel combustion in 2017**

## NOx Implied emission factors in Finnish air pollutant inventory for 2017

2017	Nox	1A1a	ANIMAL-BASED FUELS	0,080957018	t/TJ
2017	Nox	1A1a	BARK	0,091691122	t/TJ
2017	Nox	1A1a	BIOGAS FROM WASTEWATER TREATMENT	0,070000000	t/TJ
2017	Nox	1A1a	BLAST FURNACE GAS	0,011330142	t/TJ
2017	Nox	1A1a	CHIPS FROM ROUNDWOOD	0,092517240	t/TJ
2017	Nox	1A1a	COAL (S=1.0%)	0,108084127	t/TJ
2017	Nox	1A1a	COKE OVEN GAS	0,011330142	t/TJ
2017	Nox	1A1a	DEINKING WASTE	0,057940219	t/TJ
2017	Nox	1A1a	DEMOLITION WOOD	0,094769907	t/TJ
2017	Nox	1A1a	DIESEL OIL (S=001%)	2,000000000	t/TJ
2017	Nox	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,100000000	t/TJ
2017	Nox	1A1a	FOREST RESIDUE CHIPS	0,095234111	t/TJ
2017	Nox	1A1a	GASOIL (FOR NON-ROAD USE)	0,159360014	t/TJ
2017	Nox	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,052403533	t/TJ
2017	Nox	1A1a	HEAVY FUEL OIL (S<1%)	0,154720439	t/TJ
2017	Nox	1A1a	HYDROGEN	0,084889486	t/TJ
2017	Nox	1A1a	INDUSTRIAL BIOGAS	0,080002197	t/TJ
2017	Nox	1A1a	INDUSTRIAL WASTE	0,068761480	t/TJ
2017	Nox	1A1a	LANDFILL GAS	0,056791801	t/TJ
2017	Nox	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,120946034	t/TJ
2017	Nox	1A1a	LIQUID BIOFUELS	0,080612366	t/TJ
2017	Nox	1A1a	LIQUID GAS	0,061401985	t/TJ
2017	Nox	1A1a	MILLED PEAT	0,092880798	t/TJ
2017	Nox	1A1a	MUNICIPAL WASTE - unsorted	0,102626004	t/TJ
2017	Nox	1A1a	NATURAL GAS	0,050020158	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Nox	1A1a	INDUSTRY	0,095522149	t/TJ
2017	Nox	1A1a	OTHER FOSSIL GAS	0,108607397	t/TJ
2017	Nox	1A1a	OTHER FOSSIL LIQUID	0,110391185	t/TJ
2017	Nox	1A1a	OTHER FOSSIL SOLID	0,090995572	t/TJ
2017	Nox	1A1a	OTHER NON-FOSSIL GAS	0,014718644	t/TJ
2017	Nox	1A1a	OTHER NON-FOSSIL SOLID	0,082553196	t/TJ
2017	Nox	1A1a	OTHER WASTE	0,109029350	t/TJ
2017	Nox	1A1a	OTHER WOOD RESIDUE	0,126152587	t/TJ
2017	Nox	1A1a	OXYGEN STEEL FURNACE GAS	0,066960502	t/TJ
2017	Nox	1A1a	PEAT PELLETS AND BRIQUETTES	0,113878150	t/TJ
2017	Nox	1A1a	RECOVERED FUEL (REF 2)	0,099981560	t/TJ
2017	Nox	1A1a	RECOVERED FUEL (REF 3)	0,068796866	t/TJ
2017	Nox	1A1a	RECOVERED WOOD	0,109363508	t/TJ
2017	Nox	1A1a	RECYCLED AND WASTE OILS	0,093616470	t/TJ
2017	Nox	1A1a	REFINERY GAS	0,087904919	t/TJ
2017	Nox	1A1a	REFUSE-DERIVED FUEL (RDF)	0,023681903	t/TJ
2017	Nox	1A1a	SALT TREATED WOOD	0,075910757	t/TJ
2017	Nox	1A1a	SAWDUST AND CUTTER CHIPS	0,093632467	t/TJ
2017	Nox	1A1a	SOD PEAT	0,194060809	t/TJ
2017	Nox	1A1a	TALL PITCH AND OIL	0,099331420	t/TJ
2017	Nox	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,076701999	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Nox	1A1a	FUELS)	0,109944955	t/TJ
2017	Nox	1A1a	WOOD RESIDUE CHIPS	0,097116430	t/TJ
2017	Nox	1A1b	DIESEL OIL (S=001%)	0,061059894	t/TJ
2017	Nox	1A1b	GASOIL (FOR NON-ROAD USE)	0,063689139	t/TJ
2017	Nox	1A1b	HEAVY FUEL OIL (S<1%)	0,064133842	t/TJ

2017	Nox	1A1b	LIQUID BIOFUELS	0,031454131	t/TJ
2017	Nox	1A1b	LIQUID GAS	0,057201806	t/TJ
2017	Nox	1A1b	NATURAL GAS	0,047308067	t/TJ
2017	Nox	1A1b	OTHER FOSSIL GAS	0,051436098	t/TJ
2017	Nox	1A1b	OTHER MEDIUM DISTILLATES	0,063795450	t/TJ
2017	Nox	1A1b	PETROLEUM COKE	0,038526923	t/TJ
2017	Nox	1A1b	REFINERY GAS	0,046862939	t/TJ
2017	Nox	1A2a	BLAST FURNACE GAS	0,056518694	t/TJ
2017	Nox	1A2a	COKE (S=1.0%)	0,691038340	t/TJ
2017	Nox	1A2a	COKE OVEN GAS	0,156823085	t/TJ
2017	Nox	1A2a	DIESEL OIL (S=001%)	0,100000000	t/TJ
2017	Nox	1A2a	GASOIL (FOR NON-ROAD USE)	0,130546418	t/TJ
2017	Nox	1A2a	HEAVY FUEL OIL (S<1%)	0,065412659	t/TJ
2017	Nox	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,082956771	t/TJ
2017	Nox	1A2a	LIQUID GAS	0,159049294	t/TJ
2017	Nox	1A2a	MILLED PEAT	0,150234742	t/TJ
2017	Nox	1A2a	NATURAL GAS	0,119981243	t/TJ
2017	Nox	1A2a	OTHER FOSSIL LIQUID	0,070000000	t/TJ
2017	Nox	1A2a	OTHER FOSSIL SOLID	0,000859832	t/TJ
2017	Nox	1A2a	OXYGEN STEEL FURNACE GAS	0,120089096	t/TJ
2017	Nox	1A2a	WOOD RESIDUE CHIPS	0,150234742	t/TJ
2017	Nox	1A2b	COAL (S=1.0%)	0,169947518	t/TJ
2017	Nox	1A2b	COKE (S=1.0%)	0,166187603	t/TJ
2017	Nox	1A2b	GASOIL (FOR NON-ROAD USE)	0,166187603	t/TJ
2017	Nox	1A2b	HEAVY FUEL OIL (S<1%)	0,178382928	t/TJ
2017	Nox	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,172452465	t/TJ
2017	Nox	1A2b	LIQUID GAS	0,086038698	t/TJ
2017	Nox	1A2b	NATURAL GAS	0,082067251	t/TJ
2017	Nox	1A2b	OTHER FOSSIL SOLID	0,166187603	t/TJ
2017	Nox	1A2b	RECYCLED AND WASTE OILS	0,166187603	t/TJ
2017	Nox	1A2c	COAL (S=1.0%)	0,100391278	t/TJ
2017	Nox	1A2c	GASOIL (FOR NON-ROAD USE)	0,171612726	t/TJ
2017	Nox	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,277379605	t/TJ
2017	Nox	1A2c	HEAVY FUEL OIL (S<1%)	0,604086808	t/TJ
2017	Nox	1A2c	HYDROGEN	0,032778463	t/TJ
2017	Nox	1A2c	INDUSTRIAL BIOGAS	0,070000000	t/TJ
2017	Nox	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,143735386	t/TJ
2017	Nox	1A2c	LIQUID GAS	0,078759870	t/TJ
2017	Nox	1A2c	NATURAL GAS	0,107529846	t/TJ
2017	Nox	1A2c	OTHER FOSSIL GAS	0,070000000	t/TJ
2017	Nox	1A2c	OTHER FOSSIL LIQUID	0,070000000	t/TJ
2017	Nox	1A2c	OTHER MEDIUM DISTILLATES	0,070000000	t/TJ
2017	Nox	1A2c	OTHER NON-FOSSIL GAS	0,070000000	t/TJ
2017	Nox	1A2c	PETROLEUM COKE	0,038810039	t/TJ
2017	Nox	1A2c	REFINERY GAS	0,041368540	t/TJ
2017	Nox	1A2c	TALL PITCH AND OIL	0,049411411	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Nox	1A2c	FUELS)	0,044045002	t/TJ
2017	Nox	1A2d	ANIMAL-BASED FUELS	0,065260060	t/TJ
2017	Nox	1A2d	AROMATIC GAS	0,070000000	t/TJ
2017	Nox	1A2d	BARK	0,105827566	t/TJ
2017	Nox	1A2d	BLACK LIQUOR	0,069354231	t/TJ
2017	Nox	1A2d	CHIPS FROM ROUNDWOOD	0,108066185	t/TJ
2017	Nox	1A2d	COAL (S=1.0%)	0,111980448	t/TJ
2017	Nox	1A2d	DEMOLITION WOOD	0,043928125	t/TJ
2017	Nox	1A2d	FOREST RESIDUE CHIPS	0,124837099	t/TJ
2017	Nox	1A2d	GASOIL (FOR NON-ROAD USE)	0,187843516	t/TJ

2017	Nox	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,233325613	t/TJ
2017	Nox	1A2d	HEAVY FUEL OIL (S<1%)	0,154732225	t/TJ
2017	Nox	1A2d	HYDROGEN	0,154748019	t/TJ
2017	Nox	1A2d	INDUSTRIAL BIOGAS	0,270223698	t/TJ
2017	Nox	1A2d	INDUSTRIAL WASTE	0,070000000	t/TJ
2017	Nox	1A2d	LANDFILL GAS	0,066956738	t/TJ
2017	Nox	1A2d	LIGHT FUEL OIL (S=0.0915%)	0,435579869	t/TJ
2017	Nox	1A2d	LIQUID BIOFUELS	0,064305466	t/TJ
2017	Nox	1A2d	LIQUID GAS	0,101445445	t/TJ
2017	Nox	1A2d	METHANOL	0,305567845	t/TJ
2017	Nox	1A2d	MILLED PEAT	0,137872881	t/TJ
2017	Nox	1A2d	NATURAL GAS	0,076361754	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Nox	1A2d	INDUSTRY	0,131073655	t/TJ
2017	Nox	1A2d	OTHER NON-FOSSIL SOLID	0,080268114	t/TJ
2017	Nox	1A2d	OTHER WASTE	0,052539937	t/TJ
2017	Nox	1A2d	OTHER WOOD RESIDUE	0,163551361	t/TJ
2017	Nox	1A2d	PLASTIC WASTE	0,127631015	t/TJ
2017	Nox	1A2d	RECOVERED FUEL (REF 2)	0,080014785	t/TJ
2017	Nox	1A2d	RECOVERED WOOD	0,066656061	t/TJ
2017	Nox	1A2d	RECYCLED AND WASTE OILS	0,043928125	t/TJ
2017	Nox	1A2d	SALT TREATED WOOD	0,043928125	t/TJ
2017	Nox	1A2d	SAWDUST AND CUTTER CHIPS	0,105443512	t/TJ
2017	Nox	1A2d	SOD PEAT	0,135355325	t/TJ
2017	Nox	1A2d	SULPHUR CONCENTRATE	0,193637307	t/TJ
2017	Nox	1A2d	TALL PITCH AND OIL	0,081768748	t/TJ
2017	Nox	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,105705459	t/TJ
2017	Nox	1A2d	WOOD RESIDUE CHIPS	0,090111716	t/TJ
2017	Nox	1A2e	ANIMAL-BASED FUELS	0,137734937	t/TJ
2017	Nox	1A2e	COAL (S=1.0%)	0,136884683	t/TJ
2017	Nox	1A2e	COKE (S=1.0%)	0,170000000	t/TJ
2017	Nox	1A2e	DIESEL OIL (S=001%)	0,100000000	t/TJ
2017	Nox	1A2e	FOREST RESIDUE CHIPS	0,200000000	t/TJ
2017	Nox	1A2e	GASOIL (FOR NON-ROAD USE)	0,225166575	t/TJ
2017	Nox	1A2e	HEAVY FUEL OIL (S<1%)	0,249008343	t/TJ
2017	Nox	1A2e	INDUSTRIAL BIOGAS	0,222501075	t/TJ
2017	Nox	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,085051550	t/TJ
2017	Nox	1A2e	LIQUID GAS	0,054418587	t/TJ
2017	Nox	1A2e	MILLED PEAT	0,191971029	t/TJ
2017	Nox	1A2e	NATURAL GAS	0,053447456	t/TJ
2017	Nox	1A2e	OTHER NON-FOSSIL LIQUID	0,039130287	t/TJ
2017	Nox	1A2e	PEAT PELLETS AND BRIQUETTES	0,228424536	t/TJ
2017	Nox	1A2e	SAWDUST AND CUTTER CHIPS	0,167406148	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Nox	1A2e	FUELS)	0,100000000	t/TJ
2017	Nox	1A2e	WOOD RESIDUE CHIPS	0,120000000	t/TJ
2017	Nox	1A2f	CHIPS FROM ROUNDWOOD	0,049627474	t/TJ
2017	Nox	1A2f	COAL (S=1.0%)	0,218034392	t/TJ
2017	Nox	1A2f	COKE (S=1.0%)	0,074775607	t/TJ
2017	Nox	1A2f	COKE OVEN GAS	0,037191101	t/TJ
2017	Nox	1A2f	DIESEL OIL (S=001%)	0,082840956	t/TJ
2017	Nox	1A2f	FOREST RESIDUE CHIPS	0,122925123	t/TJ
2017	Nox	1A2f	GASOIL (FOR NON-ROAD USE)	0,222520750	t/TJ
2017	Nox	1A2f	HEAVY FUEL OIL (S<1%)	0,185807070	t/TJ
2017	Nox	1A2f	INDUSTRIAL BIOGAS	0,550727695	t/TJ
2017	Nox	1A2f	LANDFILL GAS	0,053536018	t/TJ
2017	Nox	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,072062116	t/TJ

2017	Nox	1A2f	LIQUID GAS	0,093451030	t/TJ
2017	Nox	1A2f	NATURAL GAS	0,153389853	t/TJ
2017	Nox	1A2f	OXYGEN STEEL FURNACE GAS	0,017787768	t/TJ
2017	Nox	1A2f	PETROLEUM COKE	0,345394044	t/TJ
2017	Nox	1A2f	RECOVERED FUEL (REF 2)	0,328197826	t/TJ
2017	Nox	1A2f	RECYCLED AND WASTE OILS	0,278948913	t/TJ
2017	Nox	1A2f	RUBBER WASTE	0,366759070	t/TJ
2017	Nox	1A2f	SAWDUST AND CUTTER CHIPS	0,221633967	t/TJ
2017	Nox	1A2gvii	DIESEL OIL (S=001%)	0,428342925	t/TJ
2017	Nox	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,258744387	t/TJ
2017	Nox	1A2gviii	BARK	0,082802570	t/TJ
2017	Nox	1A2gviii	BIOGAS FROM WASTEWATER TREATMENT	0,154447504	t/TJ
2017	Nox	1A2gviii	CHIPS FROM ROUNDWOOD	0,100315995	t/TJ
2017	Nox	1A2gviii	COAL (S=1.0%)	0,080177102	t/TJ
2017	Nox	1A2gviii	DIESEL OIL (S=001%)	0,306472913	t/TJ
2017	Nox	1A2gviii	FOREST RESIDUE CHIPS	0,085124662	t/TJ
2017	Nox	1A2gviii	GASIFIED WASTE	0,141860369	t/TJ
2017	Nox	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,733031848	t/TJ
2017	Nox	1A2gviii	HAZARDOUS WASTE	0,072533761	t/TJ
2017	Nox	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,100000000	t/TJ
2017	Nox	1A2gviii	HEAVY FUEL OIL (S<1%)	0,212397048	t/TJ
2017	Nox	1A2gviii	INDUSTRIAL BIOGAS	0,070000000	t/TJ
2017	Nox	1A2gviii	INDUSTRIAL WASTE	0,099133516	t/TJ
2017	Nox	1A2gviii	LANDFILL GAS	0,142025506	t/TJ
2017	Nox	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,294708375	t/TJ
2017	Nox	1A2gviii	LIQUID GAS	0,074060682	t/TJ
2017	Nox	1A2gviii	MILLED PEAT	0,177916251	t/TJ
2017	Nox	1A2gviii	MUNICIPAL WASTE - unsorted	0,090941373	t/TJ
2017	Nox	1A2gviii	NATURAL GAS	0,294804558	t/TJ
2017	Nox	1A2gviii	OTHER FOSSIL LIQUID	0,080177102	t/TJ
2017	Nox	1A2gviii	OTHER NON-FOSSIL GAS	0,078788765	t/TJ
2017	Nox	1A2gviii	OTHER NON-FOSSIL LIQUID	0,100000000	t/TJ
2017	Nox	1A2gviii	OTHER NON-FOSSIL SOLID	0,113739374	t/TJ
2017	Nox	1A2gviii	OTHER WOOD RESIDUE	0,131872094	t/TJ
2017	Nox	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,097996830	t/TJ
2017	Nox	1A2gviii	RECOVERED FUEL (REF 2)	0,113328422	t/TJ
2017	Nox	1A2gviii	RECOVERED WOOD	0,113328422	t/TJ
2017	Nox	1A2gviii	SAWDUST AND CUTTER CHIPS	0,108262312	t/TJ
2017	Nox	1A2gviii	SOD PEAT	0,088922885	t/TJ
2017	Nox	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,107055141	t/TJ
2017	Nox	1A2gviii	FUELS)	0,119619225	t/TJ
2017	Nox	1A2gviii	WOOD RESIDUE CHIPS	0,102274941	t/TJ
2017	Nox	1A3ai(i)	KEROSENE (JET FUEL)	0,320036110	t/TJ
2017	Nox	1A3aii(i)	AVIATION GASOLINE	0,103067681	t/TJ
2017	Nox	1A3aii(i)	KEROSENE (JET FUEL)	0,281485226	t/TJ
2017	Nox	1A3bi	DIESEL OIL (S=001%)	0,279236782	t/TJ
2017	Nox	1A3bi	MOTOR GASOLINE (S=0.001%)	0,074087863	t/TJ
2017	Nox	1A3bi	NATURAL GAS	0,009513093	t/TJ
2017	Nox	1A3bii	DIESEL OIL (S=001%)	0,340112553	t/TJ
2017	Nox	1A3bii	MOTOR GASOLINE (S=0.001%)	0,765291982	t/TJ
2017	Nox	1A3bii	NATURAL GAS	0,009673807	t/TJ
2017	Nox	1A3biii	DIESEL OIL (S=001%)	0,242156994	t/TJ
2017	Nox	1A3biii	NATURAL GAS	0,089996261	t/TJ
2017	Nox	1A3biv	DIESEL OIL (S=001%)	0,149693284	t/TJ
2017	Nox	1A3biv	MOTOR GASOLINE (S=0.001%)	0,121436790	t/TJ
2017	Nox	1A3c	GASOIL (FOR NON-ROAD USE)	1,629546916	t/TJ

2017	Nox	1A3dii	DIESEL OIL (S=001%)	1,252343138	t/TJ
2017	Nox	1A3dii	GASOIL (FOR NON-ROAD USE)	1,375056029	t/TJ
2017	Nox	1A3dii	HEAVY FUEL OIL (normal, S>1%)	1,397662631	t/TJ
2017	Nox	1A3dii	MOTOR GASOLINE (S=0.001%)	0,380666085	t/TJ
2017	Nox	1A3ei	NATURAL GAS	0,059688678	t/TJ
2017	Nox	1A4ai	FOREST WOODFUEL	0,080000000	t/TJ
2017	Nox	1A4ai	GASOIL (FOR NON-ROAD USE)	0,100000000	t/TJ
2017	Nox	1A4ai	HEAVY FUEL OIL (S<1%)	0,081256047	t/TJ
2017	Nox	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,080542143	t/TJ
2017	Nox	1A4ai	LIQUID GAS	0,070000000	t/TJ
2017	Nox	1A4ai	NATURAL GAS	0,050680350	t/TJ
2017	Nox	1A4ai	SOD PEAT	0,119512195	t/TJ
2017	Nox	1A4aii	DIESEL OIL (S=001%)	0,490906464	t/TJ
2017	Nox	1A4aii	LIQUID GAS	0,521647806	t/TJ
2017	Nox	1A4aii	MOTOR GASOLINE (S=0.001%)	0,084466691	t/TJ
2017	Nox	1A4bi	COAL (S=1.0%)	0,050000000	t/TJ
2017	Nox	1A4bi	FOREST WOODFUEL	0,080000000	t/TJ
2017	Nox	1A4bi	HEAVY FUEL OIL (S<1%)	0,080000000	t/TJ
2017	Nox	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,080000000	t/TJ
2017	Nox	1A4bi	LIQUID GAS	0,050000000	t/TJ
2017	Nox	1A4bi	NATURAL GAS	0,050000000	t/TJ
2017	Nox	1A4bi	PARAFFIN	0,080000000	t/TJ
2017	Nox	1A4bi	SOD PEAT	0,100000000	t/TJ
2017	Nox	1A4bii	DIESEL OIL (S=001%)	0,859766913	t/TJ
2017	Nox	1A4bii	MOTOR GASOLINE (S=0.001%)	0,253279751	t/TJ
2017	Nox	1A4ci	COAL (S=1.0%)	0,170000000	t/TJ
2017	Nox	1A4ci	FOREST WOODFUEL	0,080000000	t/TJ
2017	Nox	1A4ci	HEAVY FUEL OIL (S<1%)	0,080000000	t/TJ
2017	Nox	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,080000000	t/TJ
2017	Nox	1A4ci	LIQUID GAS	0,050000000	t/TJ
2017	Nox	1A4ci	NATURAL GAS	0,050000000	t/TJ
2017	Nox	1A4ci	SOD PEAT	0,100000000	t/TJ
2017	Nox	1A4cii	DIESEL OIL (S=001%)	0,322124681	t/TJ
2017	Nox	1A4cii	MOTOR GASOLINE (S=0.001%)	0,067021111	t/TJ
2017	Nox	1A4ciii	GASOIL (FOR NON-ROAD USE)	1,362962963	t/TJ
2017	Nox	1A5a	FOREST WOODFUEL	0,100000000	t/TJ
2017	Nox	1A5a	HEAVY FUEL OIL (S<1%)	0,080000000	t/TJ
2017	Nox	1A5a	LANDFILL GAS	0,050000000	t/TJ
2017	Nox	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,203329566	t/TJ
2017	Nox	1A5a	LIQUID GAS	0,050000000	t/TJ
2017	Nox	1A5a	NATURAL GAS	0,050000000	t/TJ
2017	Nox	1A5a	OTHER PETROLEUM PRODUCTS	0,080000000	t/TJ



## NMVOC Implied emission factors in Finnish air pollutant inventory for 2017

2017	NMVOC	1A1a	ANIMAL-BASED FUELS	0,002034886	t/TJ
2017	NMVOC	1A1a	BARK	0,007624581	t/TJ
2017	NMVOC	1A1a	BIOGAS FROM WASTEWATER TREATMENT	0,001000000	t/TJ
2017	NMVOC	1A1a	BLAST FURNACE GAS	0,001000000	t/TJ
2017	NMVOC	1A1a	CHIPS FROM ROUNDWOOD	0,006613887	t/TJ
2017	NMVOC	1A1a	COAL (S=1.0%)	0,002994097	t/TJ
2017	NMVOC	1A1a	COKE OVEN GAS	0,001000000	t/TJ
2017	NMVOC	1A1a	DEINKING WASTE	0,003000000	t/TJ
2017	NMVOC	1A1a	DEMOLITION WOOD	0,003016769	t/TJ
2017	NMVOC	1A1a	DIESEL OIL (S=001%)	0,004000000	t/TJ
2017	NMVOC	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,050000000	t/TJ
2017	NMVOC	1A1a	FOREST RESIDUE CHIPS	0,008008702	t/TJ
2017	NMVOC	1A1a	GASOIL (FOR NON-ROAD USE)	0,001817291	t/TJ
2017	NMVOC	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,002920647	t/TJ
2017	NMVOC	1A1a	HEAVY FUEL OIL (S<1%)	0,002776452	t/TJ
2017	NMVOC	1A1a	HYDROGEN	0,001000000	t/TJ
2017	NMVOC	1A1a	INDUSTRIAL BIOGAS	0,002740945	t/TJ
2017	NMVOC	1A1a	INDUSTRIAL WASTE	0,009702340	t/TJ
2017	NMVOC	1A1a	LANDFILL GAS	0,001310913	t/TJ
2017	NMVOC	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,003484919	t/TJ
2017	NMVOC	1A1a	LIQUID BIOFUELS	0,001220280	t/TJ
2017	NMVOC	1A1a	LIQUID GAS	0,001063122	t/TJ
2017	NMVOC	1A1a	MILLED PEAT	0,003537912	t/TJ
2017	NMVOC	1A1a	MUNICIPAL WASTE - unsorted	0,019425902	t/TJ
2017	NMVOC	1A1a	NATURAL GAS	0,002442841	t/TJ
2017	NMVOC	1A1a	OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	NMVOC	1A1a	INDUSTRY	0,005003918	t/TJ
2017	NMVOC	1A1a	OTHER FOSSIL GAS	0,007135752	t/TJ
2017	NMVOC	1A1a	OTHER FOSSIL LIQUID	0,003000000	t/TJ
2017	NMVOC	1A1a	OTHER FOSSIL SOLID	0,002964420	t/TJ
2017	NMVOC	1A1a	OTHER NON-FOSSIL GAS	0,007459197	t/TJ
2017	NMVOC	1A1a	OTHER NON-FOSSIL SOLID	0,019162518	t/TJ
2017	NMVOC	1A1a	OTHER WASTE	0,003000000	t/TJ
2017	NMVOC	1A1a	OTHER WOOD RESIDUE	0,007170866	t/TJ
2017	NMVOC	1A1a	OXYGEN STEEL FURNACE GAS	0,003000000	t/TJ
2017	NMVOC	1A1a	PEAT PELLETS AND BRIQUETTES	0,001998348	t/TJ
2017	NMVOC	1A1a	RECOVERED FUEL (REF 2)	0,020394506	t/TJ
2017	NMVOC	1A1a	RECOVERED FUEL (REF 3)	0,009989970	t/TJ
2017	NMVOC	1A1a	RECOVERED WOOD	0,024608311	t/TJ
2017	NMVOC	1A1a	RECYCLED AND WASTE OILS	0,003000000	t/TJ
2017	NMVOC	1A1a	REFINERY GAS	0,050000000	t/TJ
2017	NMVOC	1A1a	REFUSE-DERIVED FUEL (RDF)	0,003000000	t/TJ
2017	NMVOC	1A1a	SALT TREATED WOOD	0,003000000	t/TJ
2017	NMVOC	1A1a	SAWDUST AND CUTTER CHIPS	0,005962666	t/TJ
2017	NMVOC	1A1a	SOD PEAT	0,012038547	t/TJ
2017	NMVOC	1A1a	TALL PITCH AND OIL	0,035118282	t/TJ
2017	NMVOC	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,010320170	t/TJ
2017	NMVOC	1A1a	WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	NMVOC	1A1a	FUELS)	0,014585445	t/TJ
2017	NMVOC	1A1a	WOOD RESIDUE CHIPS	0,022983068	t/TJ
2017	NMVOC	1A1b	DIESEL OIL (S=001%)	0,003816243	t/TJ
2017	NMVOC	1A1b	GASOIL (FOR NON-ROAD USE)	0,003212796	t/TJ
2017	NMVOC	1A1b	HEAVY FUEL OIL (S<1%)	0,001874634	t/TJ
2017	NMVOC	1A1b	LIQUID BIOFUELS	0,001000000	t/TJ
2017	NMVOC	1A1b	LIQUID GAS	0,000058465	t/TJ

2017	NM VOC	1A1b	NATURAL GAS	0,001452999	t/TJ
2017	NM VOC	1A1b	OTHER FOSSIL GAS	0,001000000	t/TJ
2017	NM VOC	1A1b	OTHER MEDIUM DISTILLATES	0,003054377	t/TJ
2017	NM VOC	1A1b	PETROLEUM COKE	0,003374804	t/TJ
2017	NM VOC	1A1b	REFINERY GAS	0,000967686	t/TJ
2017	NM VOC	1A2a	BLAST FURNACE GAS	0,000890551	t/TJ
2017	NM VOC	1A2a	COKE (S=1.0%)	0,001948801	t/TJ
2017	NM VOC	1A2a	COKE OVEN GAS	0,000574186	t/TJ
2017	NM VOC	1A2a	GASOIL (FOR NON-ROAD USE)	0,001222227	t/TJ
2017	NM VOC	1A2a	HEAVY FUEL OIL (S<1%)	0,001000000	t/TJ
2017	NM VOC	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,001263893	t/TJ
2017	NM VOC	1A2a	LIQUID GAS	0,000480384	t/TJ
2017	NM VOC	1A2a	MILLED PEAT	0,050000000	t/TJ
2017	NM VOC	1A2a	NATURAL GAS	0,000859069	t/TJ
2017	NM VOC	1A2a	OTHER FOSSIL LIQUID	0,001000000	t/TJ
2017	NM VOC	1A2a	OXYGEN STEEL FURNACE GAS	0,000704454	t/TJ
2017	NM VOC	1A2a	WOOD RESIDUE CHIPS	0,050000000	t/TJ
2017	NM VOC	1A2b	COAL (S=1.0%)	0,000013766	t/TJ
2017	NM VOC	1A2b	COKE (S=1.0%)	0,001000000	t/TJ
2017	NM VOC	1A2b	GASOIL (FOR NON-ROAD USE)	0,001000000	t/TJ
2017	NM VOC	1A2b	HEAVY FUEL OIL (S<1%)	0,001000000	t/TJ
2017	NM VOC	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,000973952	t/TJ
2017	NM VOC	1A2b	LIQUID GAS	0,000998813	t/TJ
2017	NM VOC	1A2b	NATURAL GAS	0,001000000	t/TJ
2017	NM VOC	1A2b	OTHER FOSSIL SOLID	0,001000000	t/TJ
2017	NM VOC	1A2b	RECYCLED AND WASTE OILS	0,001000000	t/TJ
2017	NM VOC	1A2c	COAL (S=1.0%)	0,001000000	t/TJ
2017	NM VOC	1A2c	GASOIL (FOR NON-ROAD USE)	0,005000000	t/TJ
2017	NM VOC	1A2c	HEAVY FUEL OIL (S<1%)	0,000978908	t/TJ
2017	NM VOC	1A2c	HYDROGEN	0,001000000	t/TJ
2017	NM VOC	1A2c	INDUSTRIAL BIOGAS	0,001000000	t/TJ
2017	NM VOC	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,000963933	t/TJ
2017	NM VOC	1A2c	LIQUID GAS	0,000459112	t/TJ
2017	NM VOC	1A2c	NATURAL GAS	0,000994798	t/TJ
2017	NM VOC	1A2c	OTHER NON-FOSSIL GAS	0,001000000	t/TJ
2017	NM VOC	1A2c	REFINERY GAS	0,000121522	t/TJ
2017	NM VOC	1A2c	TALL PITCH AND OIL	0,000488323	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	NM VOC	1A2c	FUELS)	0,000385046	t/TJ
2017	NM VOC	1A2d	ANIMAL-BASED FUELS	0,003141181	t/TJ
2017	NM VOC	1A2d	AROMATIC GAS	0,001000000	t/TJ
2017	NM VOC	1A2d	BARK	0,003143914	t/TJ
2017	NM VOC	1A2d	BLACK LIQUOR	0,000878308	t/TJ
2017	NM VOC	1A2d	CHIPS FROM ROUNDWOOD	0,003833319	t/TJ
2017	NM VOC	1A2d	COAL (S=1.0%)	0,003000000	t/TJ
2017	NM VOC	1A2d	DEMOLITION WOOD	0,003000000	t/TJ
2017	NM VOC	1A2d	FOREST RESIDUE CHIPS	0,002904484	t/TJ
2017	NM VOC	1A2d	GASOIL (FOR NON-ROAD USE)	0,002199990	t/TJ
2017	NM VOC	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,001000000	t/TJ
2017	NM VOC	1A2d	HEAVY FUEL OIL (S<1%)	0,001416556	t/TJ
2017	NM VOC	1A2d	HYDROGEN	0,014394790	t/TJ
2017	NM VOC	1A2d	INDUSTRIAL BIOGAS	0,001000000	t/TJ
2017	NM VOC	1A2d	INDUSTRIAL WASTE	0,001000000	t/TJ
2017	NM VOC	1A2d	LANDFILL GAS	0,003000000	t/TJ
2017	NM VOC	1A2d	LIGHT FUEL OIL (S=0.0915%)	0,001479865	t/TJ
2017	NM VOC	1A2d	LIQUID BIOFUELS	0,001000000	t/TJ
2017	NM VOC	1A2d	LIQUID GAS	0,000965399	t/TJ

2017	NM VOC	1A2d	METHANOL	0,000827748	t/TJ
2017	NM VOC	1A2d	MILLED PEAT	0,002833945	t/TJ
2017	NM VOC	1A2d	NATURAL GAS	0,000947366	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	NM VOC	1A2d	INDUSTRY	0,002236015	t/TJ
2017	NM VOC	1A2d	OTHER NON-FOSSIL SOLID	0,003029120	t/TJ
2017	NM VOC	1A2d	OTHER WASTE	0,003000000	t/TJ
2017	NM VOC	1A2d	OTHER WOOD RESIDUE	0,047385453	t/TJ
2017	NM VOC	1A2d	PLASTIC WASTE	0,006381401	t/TJ
2017	NM VOC	1A2d	RECOVERED FUEL (REF 2)	0,003370000	t/TJ
2017	NM VOC	1A2d	RECOVERED WOOD	0,003000000	t/TJ
2017	NM VOC	1A2d	RECYCLED AND WASTE OILS	0,003000000	t/TJ
2017	NM VOC	1A2d	SALT TREATED WOOD	0,003000000	t/TJ
2017	NM VOC	1A2d	SAWDUST AND CUTTER CHIPS	0,005026443	t/TJ
2017	NM VOC	1A2d	SOD PEAT	0,003932214	t/TJ
2017	NM VOC	1A2d	SULPHUR CONCENTRATE	0,002000000	t/TJ
2017	NM VOC	1A2d	TALL PITCH AND OIL	0,002608105	t/TJ
2017	NM VOC	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,008136933	t/TJ
2017	NM VOC	1A2d	WOOD RESIDUE CHIPS	0,003269498	t/TJ
2017	NM VOC	1A2e	ANIMAL-BASED FUELS	0,050000000	t/TJ
2017	NM VOC	1A2e	COAL (S=1.0%)	0,004000000	t/TJ
2017	NM VOC	1A2e	COKE (S=1.0%)	0,004000000	t/TJ
2017	NM VOC	1A2e	DIESEL OIL (S=001%)	0,001000000	t/TJ
2017	NM VOC	1A2e	FOREST RESIDUE CHIPS	0,050000000	t/TJ
2017	NM VOC	1A2e	GASOIL (FOR NON-ROAD USE)	0,003923894	t/TJ
2017	NM VOC	1A2e	HEAVY FUEL OIL (S<1%)	0,001000000	t/TJ
2017	NM VOC	1A2e	INDUSTRIAL BIOGAS	0,001000000	t/TJ
2017	NM VOC	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,001870111	t/TJ
2017	NM VOC	1A2e	LIQUID GAS	0,001000427	t/TJ
2017	NM VOC	1A2e	MILLED PEAT	0,018704947	t/TJ
2017	NM VOC	1A2e	NATURAL GAS	0,001000000	t/TJ
2017	NM VOC	1A2e	OTHER NON-FOSSIL LIQUID	0,050000000	t/TJ
2017	NM VOC	1A2e	PEAT PELLETS AND BRIQUETTES	0,004000000	t/TJ
2017	NM VOC	1A2e	SAWDUST AND CUTTER CHIPS	0,031258535	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	NM VOC	1A2e	FUELS)	0,050000000	t/TJ
2017	NM VOC	1A2e	WOOD RESIDUE CHIPS	0,004000000	t/TJ
2017	NM VOC	1A2f	CHIPS FROM ROUNDWOOD	0,042488935	t/TJ
2017	NM VOC	1A2f	COAL (S=1.0%)	0,001861561	t/TJ
2017	NM VOC	1A2f	COKE OVEN GAS	0,001000000	t/TJ
2017	NM VOC	1A2f	DIESEL OIL (S=001%)	0,001000000	t/TJ
2017	NM VOC	1A2f	FOREST RESIDUE CHIPS	0,050000000	t/TJ
2017	NM VOC	1A2f	GASOIL (FOR NON-ROAD USE)	0,001169794	t/TJ
2017	NM VOC	1A2f	HEAVY FUEL OIL (S<1%)	0,000667721	t/TJ
2017	NM VOC	1A2f	INDUSTRIAL BIOGAS	0,000572396	t/TJ
2017	NM VOC	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,000992498	t/TJ
2017	NM VOC	1A2f	LIQUID GAS	0,000587487	t/TJ
2017	NM VOC	1A2f	NATURAL GAS	0,000763938	t/TJ
2017	NM VOC	1A2f	OXYGEN STEEL FURNACE GAS	0,001000000	t/TJ
2017	NM VOC	1A2f	PETROLEUM COKE	0,000365167	t/TJ
2017	NM VOC	1A2f	RECOVERED FUEL (REF 2)	0,000659082	t/TJ
2017	NM VOC	1A2f	RECYCLED AND WASTE OILS	0,000927721	t/TJ
2017	NM VOC	1A2f	SAWDUST AND CUTTER CHIPS	0,001000000	t/TJ
2017	NM VOC	1A2gvii	DIESEL OIL (S=001%)	0,074294653	t/TJ
2017	NM VOC	1A2gvii	MOTOR GASOLINE (S=0.001%)	1,037897283	t/TJ
2017	NM VOC	1A2gviii	BARK	0,022301656	t/TJ
2017	NM VOC	1A2gviii	BIOGAS FROM WASTEWATER TREATMENT	0,002146992	t/TJ

2017	NM VOC	1A2gviii	CHIPS FROM ROUNDWOOD	0,041386997	t/TJ
2017	NM VOC	1A2gviii	COAL (S=1.0%)	0,050000000	t/TJ
2017	NM VOC	1A2gviii	DIESEL OIL (S=001%)	0,027889223	t/TJ
2017	NM VOC	1A2gviii	FOREST RESIDUE CHIPS	0,026838271	t/TJ
2017	NM VOC	1A2gviii	GASIFIED WASTE	0,021890095	t/TJ
2017	NM VOC	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,003653004	t/TJ
2017	NM VOC	1A2gviii	HAZARDOUS WASTE	0,010000000	t/TJ
2017	NM VOC	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,001000000	t/TJ
2017	NM VOC	1A2gviii	HEAVY FUEL OIL (S<1%)	0,001633005	t/TJ
2017	NM VOC	1A2gviii	INDUSTRIAL BIOGAS	0,001000000	t/TJ
2017	NM VOC	1A2gviii	INDUSTRIAL WASTE	0,004000000	t/TJ
2017	NM VOC	1A2gviii	LANDFILL GAS	0,021718126	t/TJ
2017	NM VOC	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,002935575	t/TJ
2017	NM VOC	1A2gviii	LIQUID GAS	0,072544176	t/TJ
2017	NM VOC	1A2gviii	MILLED PEAT	0,004017394	t/TJ
2017	NM VOC	1A2gviii	MUNICIPAL WASTE - unsorted	0,004254885	t/TJ
2017	NM VOC	1A2gviii	NATURAL GAS	0,001288590	t/TJ
2017	NM VOC	1A2gviii	OTHER FOSSIL LIQUID	0,050000000	t/TJ
2017	NM VOC	1A2gviii	OTHER NON-FOSSIL GAS	0,001000000	t/TJ
2017	NM VOC	1A2gviii	OTHER NON-FOSSIL SOLID	0,009971181	t/TJ
2017	NM VOC	1A2gviii	OTHER WOOD RESIDUE	0,019773885	t/TJ
2017	NM VOC	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,001000000	t/TJ
2017	NM VOC	1A2gviii	RECOVERED FUEL (REF 2)	0,050000000	t/TJ
2017	NM VOC	1A2gviii	RECOVERED WOOD	0,050000000	t/TJ
2017	NM VOC	1A2gviii	SAWDUST AND CUTTER CHIPS	0,022153841	t/TJ
2017	NM VOC	1A2gviii	SOD PEAT	0,049066363	t/TJ
2017	NM VOC	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,012544886	t/TJ
2017	NM VOC	1A2gviii	WOOD RESIDUE CHIPS	0,046952007	t/TJ
2017	NM VOC	1A2gviii	WOOD RESIDUE CHIPS	0,024460605	t/TJ
2017	NM VOC	1A3ai(i)	KEROSENE (JET FUEL)	0,044188742	t/TJ
2017	NM VOC	1A3aii(i)	AVIATION GASOLINE	0,413059273	t/TJ
2017	NM VOC	1A3aii(i)	KEROSENE (JET FUEL)	0,044842238	t/TJ
2017	NM VOC	1A3bi	DIESEL OIL (S=001%)	0,003647502	t/TJ
2017	NM VOC	1A3bi	MOTOR GASOLINE (S=0.001%)	0,034211263	t/TJ
2017	NM VOC	1A3bi	NATURAL GAS	0,004374427	t/TJ
2017	NM VOC	1A3bii	DIESEL OIL (S=001%)	0,025279979	t/TJ
2017	NM VOC	1A3bii	MOTOR GASOLINE (S=0.001%)	0,249606326	t/TJ
2017	NM VOC	1A3bii	NATURAL GAS	0,004740611	t/TJ
2017	NM VOC	1A3biii	DIESEL OIL (S=001%)	0,006887864	t/TJ
2017	NM VOC	1A3biii	NATURAL GAS	0,004550028	t/TJ
2017	NM VOC	1A3biv	DIESEL OIL (S=001%)	0,797942020	t/TJ
2017	NM VOC	1A3biv	MOTOR GASOLINE (S=0.001%)	0,821023310	t/TJ
2017	NM VOC	1A3c	GASOIL (FOR NON-ROAD USE)	0,087099135	t/TJ
2017	NM VOC	1A3dii	DIESEL OIL (S=001%)	0,070531838	t/TJ
2017	NM VOC	1A3dii	GASOIL (FOR NON-ROAD USE)	0,051539452	t/TJ
2017	NM VOC	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,058262657	t/TJ
2017	NM VOC	1A3dii	MOTOR GASOLINE (S=0.001%)	1,900223656	t/TJ
2017	NM VOC	1A3ei	NATURAL GAS	0,001000000	t/TJ
2017	NM VOC	1A4ai	FOREST WOODFUEL	0,003000000	t/TJ
2017	NM VOC	1A4ai	GASOIL (FOR NON-ROAD USE)	0,001000000	t/TJ
2017	NM VOC	1A4ai	HEAVY FUEL OIL (S<1%)	0,004958105	t/TJ
2017	NM VOC	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,004961638	t/TJ
2017	NM VOC	1A4ai	LIQUID GAS	0,001000000	t/TJ
2017	NM VOC	1A4ai	NATURAL GAS	0,004767337	t/TJ
2017	NM VOC	1A4ai	SOD PEAT	0,170731707	t/TJ
2017	NM VOC	1A4aii	DIESEL OIL (S=001%)	0,086635870	t/TJ



2017	NMVOC	1A4a <sup>ii</sup>	LIQUID GAS	0,798979754	t/TJ
2017	NMVOC	1A4a <sup>ii</sup>	MOTOR GASOLINE (S=0.001%)	1,322446066	t/TJ
2017	NMVOC	1A4b <sup>i</sup>	COAL (S=1.0%)	0,100000000	t/TJ
2017	NMVOC	1A4b <sup>i</sup>	FOREST WOODFUEL	0,406768520	t/TJ
2017	NMVOC	1A4b <sup>i</sup>	HEAVY FUEL OIL (S<1%)	0,005000000	t/TJ
2017	NMVOC	1A4b <sup>i</sup>	LIGHT FUEL OIL (S=0.0915%)	0,005000000	t/TJ
2017	NMVOC	1A4b <sup>i</sup>	LIQUID GAS	0,005000000	t/TJ
2017	NMVOC	1A4b <sup>i</sup>	NATURAL GAS	0,005000000	t/TJ
2017	NMVOC	1A4b <sup>i</sup>	PARAFFIN	0,005000000	t/TJ
2017	NMVOC	1A4b <sup>i</sup>	SOD PEAT	0,200000000	t/TJ
2017	NMVOC	1A4b <sup>ii</sup>	DIESEL OIL (S=001%)	0,222291458	t/TJ
2017	NMVOC	1A4b <sup>ii</sup>	MOTOR GASOLINE (S=0.001%)	0,861608871	t/TJ
2017	NMVOC	1A4c <sup>i</sup>	COAL (S=1.0%)	0,004000000	t/TJ
2017	NMVOC	1A4c <sup>i</sup>	FOREST WOODFUEL	0,003000000	t/TJ
2017	NMVOC	1A4c <sup>i</sup>	HEAVY FUEL OIL (S<1%)	0,005000000	t/TJ
2017	NMVOC	1A4c <sup>i</sup>	LIGHT FUEL OIL (S=0.0915%)	0,005000000	t/TJ
2017	NMVOC	1A4c <sup>i</sup>	LIQUID GAS	0,005000000	t/TJ
2017	NMVOC	1A4c <sup>i</sup>	NATURAL GAS	0,005000000	t/TJ
2017	NMVOC	1A4c <sup>i</sup>	SOD PEAT	0,200000000	t/TJ
2017	NMVOC	1A4c <sup>ii</sup>	DIESEL OIL (S=001%)	0,053554452	t/TJ
2017	NMVOC	1A4c <sup>ii</sup>	MOTOR GASOLINE (S=0.001%)	2,374976125	t/TJ
2017	NMVOC	1A4c <sup>iii</sup>	GASOIL (FOR NON-ROAD USE)	0,060015417	t/TJ
2017	NMVOC	1A5 <sup>a</sup>	FOREST WOODFUEL	0,010000000	t/TJ
2017	NMVOC	1A5 <sup>a</sup>	HEAVY FUEL OIL (S<1%)	0,005000000	t/TJ
2017	NMVOC	1A5 <sup>a</sup>	LANDFILL GAS	0,005000000	t/TJ
2017	NMVOC	1A5 <sup>a</sup>	LIGHT FUEL OIL (S=0.0915%)	0,009399374	t/TJ
2017	NMVOC	1A5 <sup>a</sup>	LIQUID GAS	0,005000000	t/TJ
2017	NMVOC	1A5 <sup>a</sup>	NATURAL GAS	0,005000000	t/TJ
2017	NMVOC	1A5 <sup>a</sup>	OTHER PETROLEUM PRODUCTS	0,005000000	t/TJ

## SOx Implied emission factors in Finnish air pollutant inventory for 2017

2017	SO2	1A1a	ANIMAL-BASED FUELS	0,033165836	t/TJ
2017	SO2	1A1a	BARK	0,015418070	t/TJ
2017	SO2	1A1a	BIOGAS FROM WASTEWATER TREATMENT	0,010000000	t/TJ
2017	SO2	1A1a	BLAST FURNACE GAS	0,000115865	t/TJ
2017	SO2	1A1a	CHIPS FROM ROUNDWOOD	0,009595949	t/TJ
2017	SO2	1A1a	COAL (S=1.0%)	0,089508020	t/TJ
2017	SO2	1A1a	COKE OVEN GAS	0,496563547	t/TJ
2017	SO2	1A1a	DEINKING WASTE	0,045951551	t/TJ
2017	SO2	1A1a	DEMOLITION WOOD	0,016726660	t/TJ
2017	SO2	1A1a	DIESEL OIL (S=001%)	0,000470000	t/TJ
2017	SO2	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,020000000	t/TJ
2017	SO2	1A1a	FOREST RESIDUE CHIPS	0,008988791	t/TJ
2017	SO2	1A1a	GASOIL (FOR NON-ROAD USE)	0,031026053	t/TJ
2017	SO2	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,064731752	t/TJ
2017	SO2	1A1a	HEAVY FUEL OIL (S<1%)	0,349319020	t/TJ
2017	SO2	1A1a	HYDROGEN	0,000000103	t/TJ
2017	SO2	1A1a	INDUSTRIAL BIOGAS	0,007000000	t/TJ
2017	SO2	1A1a	INDUSTRIAL WASTE	0,015287447	t/TJ
2017	SO2	1A1a	LANDFILL GAS	0,013640029	t/TJ
2017	SO2	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,035539438	t/TJ
2017	SO2	1A1a	LIQUID BIOFUELS	0,002423883	t/TJ
2017	SO2	1A1a	LIQUID GAS	0,000704016	t/TJ
2017	SO2	1A1a	MILLED PEAT	0,078371264	t/TJ
2017	SO2	1A1a	MUNICIPAL WASTE - unsorted	0,001673271	t/TJ
2017	SO2	1A1a	NATURAL GAS	0,000039111	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	SO2	1A1a	INDUSTRY	0,015307117	t/TJ
2017	SO2	1A1a	OTHER FOSSIL GAS	0,001132320	t/TJ
2017	SO2	1A1a	OTHER FOSSIL LIQUID	0,015613240	t/TJ
2017	SO2	1A1a	OTHER FOSSIL SOLID	0,036516278	t/TJ
2017	SO2	1A1a	OTHER NON-FOSSIL GAS	0,024669891	t/TJ
2017	SO2	1A1a	OTHER NON-FOSSIL SOLID	0,070676283	t/TJ
2017	SO2	1A1a	OTHER WASTE	0,172290388	t/TJ
2017	SO2	1A1a	OTHER WOOD RESIDUE	0,014714945	t/TJ
2017	SO2	1A1a	OXYGEN STEEL FURNACE GAS	0,000003562	t/TJ
2017	SO2	1A1a	PEAT PELLETS AND BRIQUETTES	0,042325236	t/TJ
2017	SO2	1A1a	RECOVERED FUEL (REF 2)	0,038910473	t/TJ
2017	SO2	1A1a	RECOVERED FUEL (REF 3)	0,001068682	t/TJ
2017	SO2	1A1a	RECOVERED WOOD	0,055329518	t/TJ
2017	SO2	1A1a	RECYCLED AND WASTE OILS	0,173068256	t/TJ
2017	SO2	1A1a	REFINERY GAS	0,001947669	t/TJ
2017	SO2	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000233354	t/TJ
2017	SO2	1A1a	SALT TREATED WOOD	0,031043598	t/TJ
2017	SO2	1A1a	SAWDUST AND CUTTER CHIPS	0,012175822	t/TJ
2017	SO2	1A1a	SOD PEAT	0,139765321	t/TJ
2017	SO2	1A1a	TALL PITCH AND OIL	0,225942720	t/TJ
2017	SO2	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,012796453	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	SO2	1A1a	FUELS)	0,005735636	t/TJ
2017	SO2	1A1a	WOOD RESIDUE CHIPS	0,012122314	t/TJ
2017	SO2	1A1b	DIESEL OIL (S=001%)	0,000282000	t/TJ
2017	SO2	1A1b	GASOIL (FOR NON-ROAD USE)	0,051831511	t/TJ
2017	SO2	1A1b	HEAVY FUEL OIL (S<1%)	0,503838517	t/TJ
2017	SO2	1A1b	LIQUID BIOFUELS	0,000941139	t/TJ
2017	SO2	1A1b	LIQUID GAS	0,000021957	t/TJ

2017	SO2	1A1b	NATURAL GAS	0,003866630	t/TJ
2017	SO2	1A1b	OTHER FOSSIL GAS	0,000801403	t/TJ
2017	SO2	1A1b	OTHER MEDIUM DISTILLATES	0,066605509	t/TJ
2017	SO2	1A1b	PETROLEUM COKE	0,284750484	t/TJ
2017	SO2	1A1b	REFINERY GAS	0,171522355	t/TJ
2017	SO2	1A2a	BLAST FURNACE GAS	0,000005187	t/TJ
2017	SO2	1A2a	COKE (S=1.0%)	0,360937982	t/TJ
2017	SO2	1A2a	COKE OVEN GAS	0,034515147	t/TJ
2017	SO2	1A2a	DIESEL OIL (S=001%)	0,000470000	t/TJ
2017	SO2	1A2a	GASOIL (FOR NON-ROAD USE)	0,033285007	t/TJ
2017	SO2	1A2a	HEAVY FUEL OIL (S<1%)	0,517755139	t/TJ
2017	SO2	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,078672431	t/TJ
2017	SO2	1A2a	LIQUID GAS	0,000006300	t/TJ
2017	SO2	1A2a	MILLED PEAT	0,099510104	t/TJ
2017	SO2	1A2a	NATURAL GAS	0,000093457	t/TJ
2017	SO2	1A2a	OTHER FOSSIL LIQUID	0,670000000	t/TJ
2017	SO2	1A2a	OTHER FOSSIL SOLID	0,054327610	t/TJ
2017	SO2	1A2a	OXYGEN STEEL FURNACE GAS	0,000003838	t/TJ
2017	SO2	1A2a	WOOD RESIDUE CHIPS	0,003317003	t/TJ
2017	SO2	1A2b	COAL (S=1.0%)	2,528564152	t/TJ
2017	SO2	1A2b	COKE (S=1.0%)	7,851517762	t/TJ
2017	SO2	1A2b	GASOIL (FOR NON-ROAD USE)	0,494312246	t/TJ
2017	SO2	1A2b	HEAVY FUEL OIL (S<1%)	3,468922002	t/TJ
2017	SO2	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,018754103	t/TJ
2017	SO2	1A2b	LIQUID GAS	0,000030298	t/TJ
2017	SO2	1A2b	NATURAL GAS	0,003499715	t/TJ
2017	SO2	1A2b	OTHER FOSSIL SOLID	22,991267240	t/TJ
2017	SO2	1A2b	RECYCLED AND WASTE OILS	5,046583159	t/TJ
2017	SO2	1A2c	COAL (S=1.0%)	0,106606707	t/TJ
2017	SO2	1A2c	GASOIL (FOR NON-ROAD USE)	0,006336296	t/TJ
2017	SO2	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,151171977	t/TJ
2017	SO2	1A2c	HEAVY FUEL OIL (S<1%)	0,517651743	t/TJ
2017	SO2	1A2c	HYDROGEN	0,000000200	t/TJ
2017	SO2	1A2c	INDUSTRIAL BIOGAS	0,007000000	t/TJ
2017	SO2	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,034909618	t/TJ
2017	SO2	1A2c	LIQUID GAS	0,005585068	t/TJ
2017	SO2	1A2c	NATURAL GAS	0,006224549	t/TJ
2017	SO2	1A2c	OTHER FOSSIL GAS	0,003700000	t/TJ
2017	SO2	1A2c	OTHER FOSSIL LIQUID	0,670000000	t/TJ
2017	SO2	1A2c	OTHER MEDIUM DISTILLATES	0,056000000	t/TJ
2017	SO2	1A2c	OTHER NON-FOSSIL GAS	0,010000000	t/TJ
2017	SO2	1A2c	PETROLEUM COKE	0,015424317	t/TJ
2017	SO2	1A2c	REFINERY GAS	0,000977067	t/TJ
2017	SO2	1A2c	TALL PITCH AND OIL	0,255330906	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	SO2	1A2c	FUELS)	0,007934256	t/TJ
2017	SO2	1A2d	ANIMAL-BASED FUELS	0,019676437	t/TJ
2017	SO2	1A2d	AROMATIC GAS	2,000000000	t/TJ
2017	SO2	1A2d	BARK	0,015410472	t/TJ
2017	SO2	1A2d	BLACK LIQUOR	0,003116374	t/TJ
2017	SO2	1A2d	CHIPS FROM ROUNDWOOD	0,008512047	t/TJ
2017	SO2	1A2d	COAL (S=1.0%)	0,050061336	t/TJ
2017	SO2	1A2d	DEMOLITION WOOD	0,017270885	t/TJ
2017	SO2	1A2d	FOREST RESIDUE CHIPS	0,006379017	t/TJ
2017	SO2	1A2d	GASOIL (FOR NON-ROAD USE)	0,493181863	t/TJ
2017	SO2	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,091473078	t/TJ
2017	SO2	1A2d	HEAVY FUEL OIL (S<1%)	0,066048902	t/TJ

2017	SO2	1A2d	HYDROGEN	0,000000001	t/TJ
2017	SO2	1A2d	INDUSTRIAL BIOGAS	0,000868832	t/TJ
2017	SO2	1A2d	INDUSTRIAL WASTE	0,670000000	t/TJ
2017	SO2	1A2d	LANDFILL GAS	0,014434674	t/TJ
2017	SO2	1A2d	LIGHT FUEL OIL (S=0.0915%)	3,308821450	t/TJ
2017	SO2	1A2d	LIQUID BIOFUELS	0,000073043	t/TJ
2017	SO2	1A2d	LIQUID GAS	0,000070231	t/TJ
2017	SO2	1A2d	METHANOL	0,057803364	t/TJ
2017	SO2	1A2d	MILLED PEAT	0,088180424	t/TJ
2017	SO2	1A2d	NATURAL GAS	0,000030619	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	SO2	1A2d	INDUSTRY	0,006923000	t/TJ
2017	SO2	1A2d	OTHER NON-FOSSIL SOLID	0,038189851	t/TJ
2017	SO2	1A2d	OTHER WASTE	0,080140221	t/TJ
2017	SO2	1A2d	OTHER WOOD RESIDUE	0,028501562	t/TJ
2017	SO2	1A2d	PLASTIC WASTE	0,056221164	t/TJ
2017	SO2	1A2d	RECOVERED FUEL (REF 2)	0,013382450	t/TJ
2017	SO2	1A2d	RECOVERED WOOD	0,016555257	t/TJ
2017	SO2	1A2d	RECYCLED AND WASTE OILS	0,026570593	t/TJ
2017	SO2	1A2d	SALT TREATED WOOD	0,002657059	t/TJ
2017	SO2	1A2d	SAWDUST AND CUTTER CHIPS	0,005596435	t/TJ
2017	SO2	1A2d	SOD PEAT	0,142791776	t/TJ
2017	SO2	1A2d	SULPHUR CONCENTRATE	0,830147567	t/TJ
2017	SO2	1A2d	TALL PITCH AND OIL	0,008419373	t/TJ
2017	SO2	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,024732332	t/TJ
2017	SO2	1A2d	WOOD RESIDUE CHIPS	0,007960439	t/TJ
2017	SO2	1A2e	ANIMAL-BASED FUELS	0,086670121	t/TJ
2017	SO2	1A2e	COAL (S=1.0%)	0,259876488	t/TJ
2017	SO2	1A2e	COKE (S=1.0%)	0,365405000	t/TJ
2017	SO2	1A2e	DIESEL OIL (S=001%)	0,000470000	t/TJ
2017	SO2	1A2e	FOREST RESIDUE CHIPS	0,020000000	t/TJ
2017	SO2	1A2e	GASOIL (FOR NON-ROAD USE)	0,038611457	t/TJ
2017	SO2	1A2e	HEAVY FUEL OIL (S<1%)	0,924187855	t/TJ
2017	SO2	1A2e	INDUSTRIAL BIOGAS	0,008287040	t/TJ
2017	SO2	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,071065030	t/TJ
2017	SO2	1A2e	LIQUID GAS	0,000709103	t/TJ
2017	SO2	1A2e	MILLED PEAT	0,151660942	t/TJ
2017	SO2	1A2e	NATURAL GAS	0,000040000	t/TJ
2017	SO2	1A2e	OTHER NON-FOSSIL LIQUID	0,009581026	t/TJ
2017	SO2	1A2e	PEAT PELLETS AND BRIQUETTES	0,125339811	t/TJ
2017	SO2	1A2e	SAWDUST AND CUTTER CHIPS	0,020000000	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	SO2	1A2e	FUELS)	0,010000000	t/TJ
2017	SO2	1A2e	WOOD RESIDUE CHIPS	0,020000000	t/TJ
2017	SO2	1A2f	CHIPS FROM ROUNDWOOD	0,006840646	t/TJ
2017	SO2	1A2f	COAL (S=1.0%)	0,248621907	t/TJ
2017	SO2	1A2f	COKE (S=1.0%)	0,705946157	t/TJ
2017	SO2	1A2f	COKE OVEN GAS	0,046118015	t/TJ
2017	SO2	1A2f	DIESEL OIL (S=001%)	0,014918033	t/TJ
2017	SO2	1A2f	FOREST RESIDUE CHIPS	0,020625021	t/TJ
2017	SO2	1A2f	GASOIL (FOR NON-ROAD USE)	0,022972253	t/TJ
2017	SO2	1A2f	HEAVY FUEL OIL (S<1%)	0,121688322	t/TJ
2017	SO2	1A2f	INDUSTRIAL BIOGAS	0,007000000	t/TJ
2017	SO2	1A2f	LANDFILL GAS	0,010909344	t/TJ
2017	SO2	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,025932174	t/TJ
2017	SO2	1A2f	LIQUID GAS	0,037309963	t/TJ
2017	SO2	1A2f	NATURAL GAS	0,000227397	t/TJ



2017	SO2	1A2f	OXYGEN STEEL FURNACE GAS	0,000007000	t/TJ
2017	SO2	1A2f	PETROLEUM COKE	0,014852588	t/TJ
2017	SO2	1A2f	RECOVERED FUEL (REF 2)	0,005493047	t/TJ
2017	SO2	1A2f	RECYCLED AND WASTE OILS	0,208365764	t/TJ
2017	SO2	1A2f	RUBBER WASTE	0,002994746	t/TJ
2017	SO2	1A2f	SAWDUST AND CUTTER CHIPS	0,061901512	t/TJ
2017	SO2	1A2gvii	DIESEL OIL (S=001%)	0,000277778	t/TJ
2017	SO2	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,000347050	t/TJ
2017	SO2	1A2gviii	BARK	0,039903204	t/TJ
2017	SO2	1A2gviii	BIOGAS FROM WASTEWATER TREATMENT	0,000092684	t/TJ
2017	SO2	1A2gviii	CHIPS FROM ROUNDWOOD	0,015739528	t/TJ
2017	SO2	1A2gviii	COAL (S=1.0%)	0,158456984	t/TJ
2017	SO2	1A2gviii	DIESEL OIL (S=001%)	0,015191815	t/TJ
2017	SO2	1A2gviii	FOREST RESIDUE CHIPS	0,019930992	t/TJ
2017	SO2	1A2gviii	GASIFIED WASTE	0,005000000	t/TJ
2017	SO2	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,021087104	t/TJ
2017	SO2	1A2gviii	HAZARDOUS WASTE	0,002823742	t/TJ
2017	SO2	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,691000000	t/TJ
2017	SO2	1A2gviii	HEAVY FUEL OIL (S<1%)	0,350673775	t/TJ
2017	SO2	1A2gviii	INDUSTRIAL BIOGAS	0,007000000	t/TJ
2017	SO2	1A2gviii	INDUSTRIAL WASTE	0,000132772	t/TJ
2017	SO2	1A2gviii	LANDFILL GAS	0,017000000	t/TJ
2017	SO2	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,092579751	t/TJ
2017	SO2	1A2gviii	LIQUID GAS	0,009734446	t/TJ
2017	SO2	1A2gviii	MILLED PEAT	0,148163300	t/TJ
2017	SO2	1A2gviii	MUNICIPAL WASTE - unsorted	0,007969808	t/TJ
2017	SO2	1A2gviii	NATURAL GAS	0,010022997	t/TJ
2017	SO2	1A2gviii	OTHER FOSSIL LIQUID	0,588953218	t/TJ
2017	SO2	1A2gviii	OTHER NON-FOSSIL GAS	0,011862179	t/TJ
2017	SO2	1A2gviii	OTHER NON-FOSSIL LIQUID	2,000000000	t/TJ
2017	SO2	1A2gviii	OTHER NON-FOSSIL SOLID	0,078168565	t/TJ
2017	SO2	1A2gviii	OTHER WOOD RESIDUE	0,029964980	t/TJ
2017	SO2	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,016150338	t/TJ
2017	SO2	1A2gviii	RECOVERED FUEL (REF 2)	0,003103168	t/TJ
2017	SO2	1A2gviii	RECOVERED WOOD	0,005490220	t/TJ
2017	SO2	1A2gviii	SAWDUST AND CUTTER CHIPS	0,023666688	t/TJ
2017	SO2	1A2gviii	SOD PEAT	0,024903325	t/TJ
2017	SO2	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,016923287	t/TJ
2017	SO2	1A2gviii	WOOD RESIDUE CHIPS	0,010339000	t/TJ
2017	SO2	1A2gviii	WOOD RESIDUE CHIPS	0,017722633	t/TJ
2017	SO2	1A3ai(i)	KEROSENE (JET FUEL)	0,019400000	t/TJ
2017	SO2	1A3aii(i)	AVIATION GASOLINE	0,000920000	t/TJ
2017	SO2	1A3aii(i)	KEROSENE (JET FUEL)	0,019399540	t/TJ
2017	SO2	1A3bi	DIESEL OIL (S=001%)	0,000251378	t/TJ
2017	SO2	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000337314	t/TJ
2017	SO2	1A3bi	NATURAL GAS	0,000030065	t/TJ
2017	SO2	1A3bii	DIESEL OIL (S=001%)	0,000251378	t/TJ
2017	SO2	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000339265	t/TJ
2017	SO2	1A3bii	NATURAL GAS	0,000030065	t/TJ
2017	SO2	1A3biii	DIESEL OIL (S=001%)	0,000251378	t/TJ
2017	SO2	1A3biii	NATURAL GAS	0,000030065	t/TJ
2017	SO2	1A3biv	DIESEL OIL (S=001%)	0,000251378	t/TJ
2017	SO2	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000339265	t/TJ
2017	SO2	1A3c	GASOIL (FOR NON-ROAD USE)	0,000277778	t/TJ
2017	SO2	1A3dii	DIESEL OIL (S=001%)	0,000251071	t/TJ
2017	SO2	1A3dii	GASOIL (FOR NON-ROAD USE)	0,018125412	t/TJ

2017	SO2	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,044194705	t/TJ
2017	SO2	1A3dii	MOTOR GASOLINE (S=0.001%)	0,000347050	t/TJ
2017	SO2	1A3ei	NATURAL GAS	0,000040000	t/TJ
2017	SO2	1A4ai	FOREST WOODFUEL	0,005000000	t/TJ
2017	SO2	1A4ai	GASOIL (FOR NON-ROAD USE)	0,043000000	t/TJ
2017	SO2	1A4ai	HEAVY FUEL OIL (S<1%)	0,438343748	t/TJ
2017	SO2	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,042924167	t/TJ
2017	SO2	1A4ai	LIQUID GAS	0,000009000	t/TJ
2017	SO2	1A4ai	NATURAL GAS	0,000040000	t/TJ
2017	SO2	1A4ai	SOD PEAT	0,180000000	t/TJ
2017	SO2	1A4aii	DIESEL OIL (S=001%)	0,000277778	t/TJ
2017	SO2	1A4aii	LIQUID GAS	0,000032544	t/TJ
2017	SO2	1A4aii	MOTOR GASOLINE (S=0.001%)	0,000347050	t/TJ
2017	SO2	1A4bi	COAL (S=1.0%)	0,313500000	t/TJ
2017	SO2	1A4bi	FOREST WOODFUEL	0,005000000	t/TJ
2017	SO2	1A4bi	HEAVY FUEL OIL (S<1%)	0,438000000	t/TJ
2017	SO2	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,043000000	t/TJ
2017	SO2	1A4bi	LIQUID GAS	0,000009000	t/TJ
2017	SO2	1A4bi	NATURAL GAS	0,000040000	t/TJ
2017	SO2	1A4bi	PARAFFIN	0,009300000	t/TJ
2017	SO2	1A4bi	SOD PEAT	0,180000000	t/TJ
2017	SO2	1A4bii	DIESEL OIL (S=001%)	0,000277778	t/TJ
2017	SO2	1A4bii	MOTOR GASOLINE (S=0.001%)	0,000347050	t/TJ
2017	SO2	1A4ci	COAL (S=1.0%)	0,627000000	t/TJ
2017	SO2	1A4ci	FOREST WOODFUEL	0,005000000	t/TJ
2017	SO2	1A4ci	HEAVY FUEL OIL (S<1%)	0,438000000	t/TJ
2017	SO2	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,043000000	t/TJ
2017	SO2	1A4ci	LIQUID GAS	0,000009000	t/TJ
2017	SO2	1A4ci	NATURAL GAS	0,000040000	t/TJ
2017	SO2	1A4ci	SOD PEAT	0,180000000	t/TJ
2017	SO2	1A4cii	DIESEL OIL (S=001%)	0,000277778	t/TJ
2017	SO2	1A4cii	MOTOR GASOLINE (S=0.001%)	0,000347050	t/TJ
2017	SO2	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,000277778	t/TJ
2017	SO2	1A5a	FOREST WOODFUEL	0,020000000	t/TJ
2017	SO2	1A5a	HEAVY FUEL OIL (S<1%)	0,438000000	t/TJ
2017	SO2	1A5a	LANDFILL GAS	0,017000000	t/TJ
2017	SO2	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,045602455	t/TJ
2017	SO2	1A5a	LIQUID GAS	0,000009000	t/TJ
2017	SO2	1A5a	NATURAL GAS	0,000040000	t/TJ
2017	SO2	1A5a	OTHER PETROLEUM PRODUCTS	0,100000000	t/TJ

### NH3 Implied emission factors in Finnish air pollutant inventory for 2017

2017	NH3	1A2gvii	DIESEL OIL (S=001%)	0,000185185	t/TJ
2017	NH3	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,000095158	t/TJ
2017	NH3	1A3c	GASOIL (FOR NON-ROAD USE)	0,000162037	t/TJ
2017	NH3	1A3dii	DIESEL OIL (S=001%)	0,000184347	t/TJ
2017	NH3	1A3dii	GASOIL (FOR NON-ROAD USE)	0,000183608	t/TJ
2017	NH3	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,000194902	t/TJ
2017	NH3	1A3dii	MOTOR GASOLINE (S=0.001%)	0,000111811	t/TJ
2017	NH3	1A4ai	FOREST WOODFUEL	0,001633579	t/TJ
2017	NH3	1A4aai	DIESEL OIL (S=001%)	0,000185185	t/TJ
2017	NH3	1A4aai	LIQUID GAS	0,000239130	t/TJ
2017	NH3	1A4aai	MOTOR GASOLINE (S=0.001%)	0,000080560	t/TJ
2017	NH3	1A4bi	COAL (S=1.0%)	0,000150000	t/TJ
2017	NH3	1A4bi	FOREST WOODFUEL	0,022061029	t/TJ
2017	NH3	1A4bii	DIESEL OIL (S=001%)	0,000185185	t/TJ
2017	NH3	1A4bii	MOTOR GASOLINE (S=0.001%)	0,000095158	t/TJ
2017	NH3	1A4ci	FOREST WOODFUEL	0,001700900	t/TJ
2017	NH3	1A4cii	DIESEL OIL (S=001%)	0,000185185	t/TJ
2017	NH3	1A4cii	MOTOR GASOLINE (S=0.001%)	0,000095158	t/TJ
2017	NH3	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,000182870	t/TJ
2017	NH3	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000017955	t/TJ

## PM2.5 Implied emission factors in Finnish air pollutant inventory for 2017

2017	PM 2.5	1A1a	ANIMAL-BASED FUELS	0,000074659	t/TJ
2017	PM 2.5	1A1a	BARK	0,001615858	t/TJ
2017	PM 2.5	1A1a	CHIPS FROM ROUNDWOOD	0,004592723	t/TJ
2017	PM 2.5	1A1a	COAL (S=1.0%)	0,000654390	t/TJ
2017	PM 2.5	1A1a	DEINKING WASTE	0,000270879	t/TJ
2017	PM 2.5	1A1a	DEMOLITION WOOD	0,000372653	t/TJ
2017	PM 2.5	1A1a	DIESEL OIL (S=001%)	0,002400000	t/TJ
2017	PM 2.5	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,154000000	t/TJ
2017	PM 2.5	1A1a	FOREST RESIDUE CHIPS	0,001860112	t/TJ
2017	PM 2.5	1A1a	GASOIL (FOR NON-ROAD USE)	0,000718886	t/TJ
2017	PM 2.5	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000643595	t/TJ
2017	PM 2.5	1A1a	HEAVY FUEL OIL (S<1%)	0,015305088	t/TJ
2017	PM 2.5	1A1a	INDUSTRIAL WASTE	0,000046250	t/TJ
2017	PM 2.5	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,000901065	t/TJ
2017	PM 2.5	1A1a	LIQUID BIOFUELS	0,000252285	t/TJ
2017	PM 2.5	1A1a	MILLED PEAT	0,001030960	t/TJ
2017	PM 2.5	1A1a	MUNICIPAL WASTE - unsorted	0,000009891	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	PM 2.5	1A1a	INDUSTRY	0,000338117	t/TJ
2017	PM 2.5	1A1a	OTHER FOSSIL LIQUID	0,000080639	t/TJ
2017	PM 2.5	1A1a	OTHER FOSSIL SOLID	0,000282384	t/TJ
2017	PM 2.5	1A1a	OTHER NON-FOSSIL SOLID	0,000770855	t/TJ
2017	PM 2.5	1A1a	OTHER WASTE	0,000088448	t/TJ
2017	PM 2.5	1A1a	OTHER WOOD RESIDUE	0,002353449	t/TJ
2017	PM 2.5	1A1a	PEAT PELLETS AND BRIQUETTES	0,000964006	t/TJ
2017	PM 2.5	1A1a	RECOVERED FUEL (REF 2)	0,000420923	t/TJ
2017	PM 2.5	1A1a	RECOVERED FUEL (REF 3)	0,000015120	t/TJ
2017	PM 2.5	1A1a	RECOVERED WOOD	0,001593062	t/TJ
2017	PM 2.5	1A1a	RECYCLED AND WASTE OILS	0,000487719	t/TJ
2017	PM 2.5	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000040071	t/TJ
2017	PM 2.5	1A1a	SALT TREATED WOOD	0,000181873	t/TJ
2017	PM 2.5	1A1a	SAWDUST AND CUTTER CHIPS	0,002793881	t/TJ
2017	PM 2.5	1A1a	SOD PEAT	0,009501401	t/TJ
2017	PM 2.5	1A1a	TALL PITCH AND OIL	0,041499895	t/TJ
2017	PM 2.5	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,001855266	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PM 2.5	1A1a	FUELS)	0,002814456	t/TJ
2017	PM 2.5	1A1a	WOOD RESIDUE CHIPS	0,002938812	t/TJ
2017	PM 2.5	1A1b	DIESEL OIL (S=001%)	0,000840000	t/TJ
2017	PM 2.5	1A1b	GASOIL (FOR NON-ROAD USE)	0,000264650	t/TJ
2017	PM 2.5	1A1b	HEAVY FUEL OIL (S<1%)	0,006361911	t/TJ
2017	PM 2.5	1A1b	LIQUID BIOFUELS	0,000840000	t/TJ
2017	PM 2.5	1A1b	OTHER MEDIUM DISTILLATES	0,000256787	t/TJ
2017	PM 2.5	1A1b	PETROLEUM COKE	0,002238707	t/TJ
2017	PM 2.5	1A2a	COKE (S=1.0%)	0,001231192	t/TJ
2017	PM 2.5	1A2a	GASOIL (FOR NON-ROAD USE)	0,170072455	t/TJ
2017	PM 2.5	1A2a	HEAVY FUEL OIL (S<1%)	0,010153730	t/TJ
2017	PM 2.5	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,001427523	t/TJ
2017	PM 2.5	1A2a	LIQUID GAS	0,000000157	t/TJ
2017	PM 2.5	1A2a	MILLED PEAT	0,003521127	t/TJ
2017	PM 2.5	1A2a	OTHER FOSSIL LIQUID	1,193448319	t/TJ
2017	PM 2.5	1A2a	OTHER FOSSIL SOLID	0,001727162	t/TJ
2017	PM 2.5	1A2a	OXYGEN STEEL FURNACE GAS	0,000031842	t/TJ
2017	PM 2.5	1A2a	WOOD RESIDUE CHIPS	0,003521127	t/TJ
2017	PM 2.5	1A2b	COAL (S=1.0%)	0,004183875	t/TJ



2017	PM 2.5	1A2b	COKE (S=1.0%)	0,001047130	t/TJ
2017	PM 2.5	1A2b	GASOIL (FOR NON-ROAD USE)	0,000117279	t/TJ
2017	PM 2.5	1A2b	HEAVY FUEL OIL (S<1%)	0,008002936	t/TJ
2017	PM 2.5	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,000129400	t/TJ
2017	PM 2.5	1A2b	OTHER FOSSIL SOLID	0,001047130	t/TJ
2017	PM 2.5	1A2b	RECYCLED AND WASTE OILS	0,005863926	t/TJ
2017	PM 2.5	1A2c	COAL (S=1.0%)	0,000468606	t/TJ
2017	PM 2.5	1A2c	GASOIL (FOR NON-ROAD USE)	0,000528652	t/TJ
2017	PM 2.5	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,003766816	t/TJ
2017	PM 2.5	1A2c	HEAVY FUEL OIL (S<1%)	0,023148402	t/TJ
2017	PM 2.5	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,002092282	t/TJ
2017	PM 2.5	1A2c	OTHER FOSSIL LIQUID	0,042000000	t/TJ
2017	PM 2.5	1A2c	OTHER MEDIUM DISTILLATES	0,000840000	t/TJ
2017	PM 2.5	1A2c	PETROLEUM COKE	0,000193773	t/TJ
2017	PM 2.5	1A2c	TALL PITCH AND OIL WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,022245921	t/TJ
2017	PM 2.5	1A2c	FUELS)	0,000241772	t/TJ
2017	PM 2.5	1A2d	ANIMAL-BASED FUELS	0,000396325	t/TJ
2017	PM 2.5	1A2d	BARK	0,001442729	t/TJ
2017	PM 2.5	1A2d	BLACK LIQUOR	0,008340203	t/TJ
2017	PM 2.5	1A2d	CHIPS FROM ROUNDWOOD	0,002424747	t/TJ
2017	PM 2.5	1A2d	COAL (S=1.0%)	0,000191134	t/TJ
2017	PM 2.5	1A2d	DEMOLITION WOOD	0,000372272	t/TJ
2017	PM 2.5	1A2d	FOREST RESIDUE CHIPS	0,001028259	t/TJ
2017	PM 2.5	1A2d	GASOIL (FOR NON-ROAD USE)	0,015638164	t/TJ
2017	PM 2.5	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,004139998	t/TJ
2017	PM 2.5	1A2d	HEAVY FUEL OIL (S<1%)	0,008568393	t/TJ
2017	PM 2.5	1A2d	HYDROGEN	0,004279750	t/TJ
2017	PM 2.5	1A2d	INDUSTRIAL BIOGAS	0,018509260	t/TJ
2017	PM 2.5	1A2d	INDUSTRIAL WASTE	0,010000000	t/TJ
2017	PM 2.5	1A2d	LIGHT FUEL OIL (S=0.0915%)	0,000769411	t/TJ
2017	PM 2.5	1A2d	LIQUID BIOFUELS	0,000625538	t/TJ
2017	PM 2.5	1A2d	LIQUID GAS	0,000000312	t/TJ
2017	PM 2.5	1A2d	METHANOL	0,007846771	t/TJ
2017	PM 2.5	1A2d	MILLED PEAT	0,001509370	t/TJ
2017	PM 2.5	1A2d	NATURAL GAS	0,000671576	t/TJ
2017	PM 2.5	1A2d	OTHER BY-PRODUCTS FROM WOOD PROCESSING INDUSTRY	0,000763461	t/TJ
2017	PM 2.5	1A2d	INDUSTRY	0,000763461	t/TJ
2017	PM 2.5	1A2d	OTHER NON-FOSSIL SOLID	0,000174852	t/TJ
2017	PM 2.5	1A2d	OTHER WASTE	0,000287691	t/TJ
2017	PM 2.5	1A2d	OTHER WOOD RESIDUE	0,005767732	t/TJ
2017	PM 2.5	1A2d	PLASTIC WASTE	0,002459298	t/TJ
2017	PM 2.5	1A2d	RECOVERED FUEL (REF 2)	0,000519284	t/TJ
2017	PM 2.5	1A2d	RECOVERED WOOD	0,000303077	t/TJ
2017	PM 2.5	1A2d	RECYCLED AND WASTE OILS	0,000749644	t/TJ
2017	PM 2.5	1A2d	SALT TREATED WOOD	0,000372272	t/TJ
2017	PM 2.5	1A2d	SAWDUST AND CUTTER CHIPS	0,004032622	t/TJ
2017	PM 2.5	1A2d	SOD PEAT	0,000580008	t/TJ
2017	PM 2.5	1A2d	SULPHUR CONCENTRATE	0,011993320	t/TJ
2017	PM 2.5	1A2d	TALL PITCH AND OIL	0,002225691	t/TJ
2017	PM 2.5	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,001320860	t/TJ
2017	PM 2.5	1A2d	WOOD RESIDUE CHIPS	0,001592866	t/TJ
2017	PM 2.5	1A2e	ANIMAL-BASED FUELS	0,006706394	t/TJ
2017	PM 2.5	1A2e	COAL (S=1.0%)	0,000590889	t/TJ
2017	PM 2.5	1A2e	COKE (S=1.0%)	0,007500000	t/TJ
2017	PM 2.5	1A2e	DIESEL OIL (S=001%)	0,000840000	t/TJ
2017	PM 2.5	1A2e	FOREST RESIDUE CHIPS	0,010000000	t/TJ

2017	PM 2.5	1A2e	GASOIL (FOR NON-ROAD USE)	0,000151067	t/TJ
2017	PM 2.5	1A2e	HEAVY FUEL OIL (S<1%)	0,025013598	t/TJ
2017	PM 2.5	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,000939101	t/TJ
2017	PM 2.5	1A2e	MILLED PEAT	0,003526558	t/TJ
2017	PM 2.5	1A2e	OTHER NON-FOSSIL LIQUID	0,000805185	t/TJ
2017	PM 2.5	1A2e	PEAT PELLETS AND BRIQUETTES	0,000554729	t/TJ
2017	PM 2.5	1A2e	SAWDUST AND CUTTER CHIPS	0,007657317	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PM 2.5	1A2e	FUELS)	0,010000000	t/TJ
2017	PM 2.5	1A2e	WOOD RESIDUE CHIPS	0,004250000	t/TJ
2017	PM 2.5	1A2f	CHIPS FROM ROUNDWOOD	0,008824873	t/TJ
2017	PM 2.5	1A2f	COAL (S=1.0%)	0,006211495	t/TJ
2017	PM 2.5	1A2f	COKE (S=1.0%)	0,004102118	t/TJ
2017	PM 2.5	1A2f	DIESEL OIL (S=001%)	3,976829993	t/TJ
2017	PM 2.5	1A2f	FOREST RESIDUE CHIPS	0,007301257	t/TJ
2017	PM 2.5	1A2f	GASOIL (FOR NON-ROAD USE)	0,000368633	t/TJ
2017	PM 2.5	1A2f	HEAVY FUEL OIL (S<1%)	0,020159700	t/TJ
2017	PM 2.5	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,013516010	t/TJ
2017	PM 2.5	1A2f	PETROLEUM COKE	0,007480826	t/TJ
2017	PM 2.5	1A2f	RECOVERED FUEL (REF 2)	0,004888860	t/TJ
2017	PM 2.5	1A2f	RECYCLED AND WASTE OILS	0,001926786	t/TJ
2017	PM 2.5	1A2f	RUBBER WASTE	0,010701150	t/TJ
2017	PM 2.5	1A2f	SAWDUST AND CUTTER CHIPS	0,003689072	t/TJ
2017	PM 2.5	1A2gvii	DIESEL OIL (S=001%)	0,024122746	t/TJ
2017	PM 2.5	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,003880783	t/TJ
2017	PM 2.5	1A2gviii	BARK	0,010496130	t/TJ
2017	PM 2.5	1A2gviii	CHIPS FROM ROUNDWOOD	0,012576879	t/TJ
2017	PM 2.5	1A2gviii	COAL (S=1.0%)	0,007500000	t/TJ
2017	PM 2.5	1A2gviii	DIESEL OIL (S=001%)	0,001070050	t/TJ
2017	PM 2.5	1A2gviii	FOREST RESIDUE CHIPS	0,011799503	t/TJ
2017	PM 2.5	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,001132866	t/TJ
2017	PM 2.5	1A2gviii	HAZARDOUS WASTE	0,000009213	t/TJ
2017	PM 2.5	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,042000000	t/TJ
2017	PM 2.5	1A2gviii	HEAVY FUEL OIL (S<1%)	0,018361897	t/TJ
2017	PM 2.5	1A2gviii	INDUSTRIAL WASTE	0,000087769	t/TJ
2017	PM 2.5	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,004004673	t/TJ
2017	PM 2.5	1A2gviii	MILLED PEAT	0,001274173	t/TJ
2017	PM 2.5	1A2gviii	MUNICIPAL WASTE - unsorted	0,000098689	t/TJ
2017	PM 2.5	1A2gviii	OTHER FOSSIL LIQUID	0,042000000	t/TJ
2017	PM 2.5	1A2gviii	OTHER NON-FOSSIL LIQUID	0,042000000	t/TJ
2017	PM 2.5	1A2gviii	OTHER NON-FOSSIL SOLID	0,001368115	t/TJ
2017	PM 2.5	1A2gviii	OTHER WOOD RESIDUE	0,003614322	t/TJ
2017	PM 2.5	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,009011487	t/TJ
2017	PM 2.5	1A2gviii	RECOVERED FUEL (REF 2)	0,000040937	t/TJ
2017	PM 2.5	1A2gviii	RECOVERED WOOD	0,000040937	t/TJ
2017	PM 2.5	1A2gviii	SAWDUST AND CUTTER CHIPS	0,018134132	t/TJ
2017	PM 2.5	1A2gviii	SOD PEAT	0,000764208	t/TJ
2017	PM 2.5	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,010414824	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PM 2.5	1A2gviii	FUELS)	0,008516897	t/TJ
2017	PM 2.5	1A2gviii	WOOD RESIDUE CHIPS	0,007841323	t/TJ
2017	PM 2.5	1A3ai(i)	KEROSENE (JET FUEL)	0,002292835	t/TJ
2017	PM 2.5	1A3aii(i)	AVIATION GASOLINE	0,008000000	t/TJ
2017	PM 2.5	1A3aii(i)	KEROSENE (JET FUEL)	0,001909831	t/TJ
2017	PM 2.5	1A3bi	DIESEL OIL (S=001%)	0,008478522	t/TJ
2017	PM 2.5	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000612308	t/TJ
2017	PM 2.5	1A3bi	NATURAL GAS	0,000419318	t/TJ

2017	PM 2.5	1A3bii	DIESEL OIL (S=001%)	0,023337560	t/TJ
2017	PM 2.5	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000651004	t/TJ
2017	PM 2.5	1A3bii	NATURAL GAS	0,000454308	t/TJ
2017	PM 2.5	1A3biii	DIESEL OIL (S=001%)	0,003936061	t/TJ
2017	PM 2.5	1A3biii	NATURAL GAS	0,000195829	t/TJ
2017	PM 2.5	1A3biv	DIESEL OIL (S=001%)	0,019358831	t/TJ
2017	PM 2.5	1A3biv	MOTOR GASOLINE (S=0.001%)	0,020223340	t/TJ
2017	PM 2.5	1A3c	GASOIL (FOR NON-ROAD USE)	0,030221214	t/TJ
2017	PM 2.5	1A3dii	DIESEL OIL (S=001%)	0,086680036	t/TJ
2017	PM 2.5	1A3dii	GASOIL (FOR NON-ROAD USE)	0,027578370	t/TJ
2017	PM 2.5	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,042860345	t/TJ
2017	PM 2.5	1A3dii	MOTOR GASOLINE (S=0.001%)	0,119596772	t/TJ
2017	PM 2.5	1A4ai	FOREST WOODFUEL	0,015859600	t/TJ
2017	PM 2.5	1A4ai	GASOIL (FOR NON-ROAD USE)	0,000840000	t/TJ
2017	PM 2.5	1A4ai	HEAVY FUEL OIL (S<1%)	0,050290174	t/TJ
2017	PM 2.5	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,000840604	t/TJ
2017	PM 2.5	1A4ai	SOD PEAT	0,018048780	t/TJ
2017	PM 2.5	1A4aii	DIESEL OIL (S=001%)	0,028390156	t/TJ
2017	PM 2.5	1A4aii	LIQUID GAS	0,004111785	t/TJ
2017	PM 2.5	1A4aii	MOTOR GASOLINE (S=0.001%)	0,090654741	t/TJ
2017	PM 2.5	1A4bi	COAL (S=1.0%)	0,160000000	t/TJ
2017	PM 2.5	1A4bi	FOREST WOODFUEL	0,171230065	t/TJ
2017	PM 2.5	1A4bi	HEAVY FUEL OIL (S<1%)	0,020700000	t/TJ
2017	PM 2.5	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,004900000	t/TJ
2017	PM 2.5	1A4bi	PARAFFIN	0,004900000	t/TJ
2017	PM 2.5	1A4bi	SOD PEAT	0,320000000	t/TJ
2017	PM 2.5	1A4bii	DIESEL OIL (S=001%)	0,091336795	t/TJ
2017	PM 2.5	1A4bii	MOTOR GASOLINE (S=0.001%)	0,007774325	t/TJ
2017	PM 2.5	1A4ci	COAL (S=1.0%)	0,003453947	t/TJ
2017	PM 2.5	1A4ci	FOREST WOODFUEL	0,015500000	t/TJ
2017	PM 2.5	1A4ci	HEAVY FUEL OIL (S<1%)	0,050400000	t/TJ
2017	PM 2.5	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,000840000	t/TJ
2017	PM 2.5	1A4ci	SOD PEAT	0,020000000	t/TJ
2017	PM 2.5	1A4cii	DIESEL OIL (S=001%)	0,019079630	t/TJ
2017	PM 2.5	1A4cii	MOTOR GASOLINE (S=0.001%)	0,116689959	t/TJ
2017	PM 2.5	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,032300000	t/TJ
2017	PM 2.5	1A5a	FOREST WOODFUEL	0,010000000	t/TJ
2017	PM 2.5	1A5a	HEAVY FUEL OIL (S<1%)	0,050400000	t/TJ
2017	PM 2.5	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,003068536	t/TJ
2017	PM 2.5	1A5a	OTHER PETROLEUM PRODUCTS	0,000840000	t/TJ

## PM10 Implied emission factors in Finnish air pollutant inventory for 2017

2017	PM 10	1A1a	ANIMAL-BASED FUELS	0,000362108	t/TJ
2017	PM 10	1A1a	BARK	0,005140634	t/TJ
2017	PM 10	1A1a	CHIPS FROM ROUNDWOOD	0,008764590	t/TJ
2017	PM 10	1A1a	COAL (S=1.0%)	0,003162587	t/TJ
2017	PM 10	1A1a	DEINKING WASTE	0,000656362	t/TJ
2017	PM 10	1A1a	DEMOLITION WOOD	0,000983063	t/TJ
2017	PM 10	1A1a	DIESEL OIL (S=001%)	0,010000000	t/TJ
2017	PM 10	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,178000000	t/TJ
2017	PM 10	1A1a	FOREST RESIDUE CHIPS	0,005861264	t/TJ
2017	PM 10	1A1a	GASOIL (FOR NON-ROAD USE)	0,002995358	t/TJ
2017	PM 10	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000902998	t/TJ
2017	PM 10	1A1a	HEAVY FUEL OIL (S<1%)	0,023459931	t/TJ
2017	PM 10	1A1a	INDUSTRIAL WASTE	0,000203862	t/TJ
2017	PM 10	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,003754437	t/TJ
2017	PM 10	1A1a	LIQUID BIOFUELS	0,001051189	t/TJ
2017	PM 10	1A1a	MILLED PEAT	0,003206643	t/TJ
2017	PM 10	1A1a	MUNICIPAL WASTE - unsorted	0,000050713	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	PM 10	1A1a	INDUSTRY	0,001002903	t/TJ
2017	PM 10	1A1a	OTHER FOSSIL LIQUID	0,000111496	t/TJ
2017	PM 10	1A1a	OTHER FOSSIL SOLID	0,000948154	t/TJ
2017	PM 10	1A1a	OTHER NON-FOSSIL SOLID	0,002469052	t/TJ
2017	PM 10	1A1a	OTHER WASTE	0,000459931	t/TJ
2017	PM 10	1A1a	OTHER WOOD RESIDUE	0,009020284	t/TJ
2017	PM 10	1A1a	PEAT PELLETS AND BRIQUETTES	0,002556482	t/TJ
2017	PM 10	1A1a	RECOVERED FUEL (REF 2)	0,001533010	t/TJ
2017	PM 10	1A1a	RECOVERED FUEL (REF 3)	0,000078625	t/TJ
2017	PM 10	1A1a	RECOVERED WOOD	0,003199867	t/TJ
2017	PM 10	1A1a	RECYCLED AND WASTE OILS	0,000717161	t/TJ
2017	PM 10	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000090560	t/TJ
2017	PM 10	1A1a	SALT TREATED WOOD	0,000449873	t/TJ
2017	PM 10	1A1a	SAWDUST AND CUTTER CHIPS	0,006300347	t/TJ
2017	PM 10	1A1a	SOD PEAT	0,049010316	t/TJ
2017	PM 10	1A1a	TALL PITCH AND OIL	0,063731981	t/TJ
2017	PM 10	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,008715465	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PM 10	1A1a	FUELS)	0,007384156	t/TJ
2017	PM 10	1A1a	WOOD RESIDUE CHIPS	0,010453846	t/TJ
2017	PM 10	1A1b	DIESEL OIL (S=001%)	0,003500000	t/TJ
2017	PM 10	1A1b	GASOIL (FOR NON-ROAD USE)	0,001102710	t/TJ
2017	PM 10	1A1b	HEAVY FUEL OIL (S<1%)	0,009770078	t/TJ
2017	PM 10	1A1b	LIQUID BIOFUELS	0,003500000	t/TJ
2017	PM 10	1A1b	OTHER MEDIUM DISTILLATES	0,001069947	t/TJ
2017	PM 10	1A1b	PETROLEUM COKE	0,011641279	t/TJ
2017	PM 10	1A2a	COKE (S=1.0%)	0,005724013	t/TJ
2017	PM 10	1A2a	GASOIL (FOR NON-ROAD USE)	0,708635212	t/TJ
2017	PM 10	1A2a	HEAVY FUEL OIL (S<1%)	0,015593229	t/TJ
2017	PM 10	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,005948011	t/TJ
2017	PM 10	1A2a	LIQUID GAS	0,000000606	t/TJ
2017	PM 10	1A2a	MILLED PEAT	0,018309859	t/TJ
2017	PM 10	1A2a	OTHER FOSSIL LIQUID	1,832795632	t/TJ
2017	PM 10	1A2a	OTHER FOSSIL SOLID	0,008981242	t/TJ
2017	PM 10	1A2a	OXYGEN STEEL FURNACE GAS	0,000123362	t/TJ
2017	PM 10	1A2a	WOOD RESIDUE CHIPS	0,018309859	t/TJ
2017	PM 10	1A2b	COAL (S=1.0%)	0,021756152	t/TJ

2017	PM 10	1A2b	COKE (S=1.0%)	0,005445074	t/TJ
2017	PM 10	1A2b	GASOIL (FOR NON-ROAD USE)	0,000488660	t/TJ
2017	PM 10	1A2b	HEAVY FUEL OIL (S<1%)	0,012290223	t/TJ
2017	PM 10	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,000539168	t/TJ
2017	PM 10	1A2b	OTHER FOSSIL SOLID	0,005445074	t/TJ
2017	PM 10	1A2b	RECYCLED AND WASTE OILS	0,009005315	t/TJ
2017	PM 10	1A2c	COAL (S=1.0%)	0,001412065	t/TJ
2017	PM 10	1A2c	GASOIL (FOR NON-ROAD USE)	0,002202716	t/TJ
2017	PM 10	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,005784753	t/TJ
2017	PM 10	1A2c	HEAVY FUEL OIL (S<1%)	0,035524750	t/TJ
2017	PM 10	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,008717840	t/TJ
2017	PM 10	1A2c	OTHER FOSSIL LIQUID	0,064500000	t/TJ
2017	PM 10	1A2c	OTHER MEDIUM DISTILLATES	0,003500000	t/TJ
2017	PM 10	1A2c	PETROLEUM COKE	0,001007619	t/TJ
2017	PM 10	1A2c	TALL PITCH AND OIL	0,034163379	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
			FUELS)	0,000549911	t/TJ
2017	PM 10	1A2d	ANIMAL-BASED FUELS	0,001093398	t/TJ
2017	PM 10	1A2d	BARK	0,002747511	t/TJ
2017	PM 10	1A2d	BLACK LIQUOR	0,011231056	t/TJ
2017	PM 10	1A2d	CHIPS FROM ROUNDWOOD	0,002994450	t/TJ
2017	PM 10	1A2d	COAL (S=1.0%)	0,000606177	t/TJ
2017	PM 10	1A2d	DEMOLITION WOOD	0,000841335	t/TJ
2017	PM 10	1A2d	FOREST RESIDUE CHIPS	0,002675635	t/TJ
2017	PM 10	1A2d	GASOIL (FOR NON-ROAD USE)	0,022852519	t/TJ
2017	PM 10	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,005035146	t/TJ
2017	PM 10	1A2d	HEAVY FUEL OIL (S<1%)	0,012072750	t/TJ
2017	PM 10	1A2d	HYDROGEN	0,005421017	t/TJ
2017	PM 10	1A2d	INDUSTRIAL BIOGAS	0,021159325	t/TJ
2017	PM 10	1A2d	INDUSTRIAL WASTE	0,052000000	t/TJ
2017	PM 10	1A2d	LIGHT FUEL OIL (S=0.0915%)	0,002225976	t/TJ
2017	PM 10	1A2d	LIQUID BIOFUELS	0,000795653	t/TJ
2017	PM 10	1A2d	LIQUID GAS	0,000000457	t/TJ
2017	PM 10	1A2d	METHANOL	0,010458139	t/TJ
2017	PM 10	1A2d	MILLED PEAT	0,003455224	t/TJ
2017	PM 10	1A2d	NATURAL GAS	0,000804942	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
			INDUSTRY	0,002190840	t/TJ
2017	PM 10	1A2d	OTHER NON-FOSSIL SOLID	0,000435944	t/TJ
2017	PM 10	1A2d	OTHER WASTE	0,000658940	t/TJ
2017	PM 10	1A2d	OTHER WOOD RESIDUE	0,028071585	t/TJ
2017	PM 10	1A2d	PLASTIC WASTE	0,012430873	t/TJ
2017	PM 10	1A2d	RECOVERED FUEL (REF 2)	0,001869560	t/TJ
2017	PM 10	1A2d	RECOVERED WOOD	0,000686490	t/TJ
2017	PM 10	1A2d	RECYCLED AND WASTE OILS	0,001036498	t/TJ
2017	PM 10	1A2d	SALT TREATED WOOD	0,000841335	t/TJ
2017	PM 10	1A2d	SAWDUST AND CUTTER CHIPS	0,004986674	t/TJ
2017	PM 10	1A2d	SOD PEAT	0,001955132	t/TJ
2017	PM 10	1A2d	SULPHUR CONCENTRATE	0,027104904	t/TJ
2017	PM 10	1A2d	TALL PITCH AND OIL	0,003046942	t/TJ
2017	PM 10	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,006273700	t/TJ
2017	PM 10	1A2d	WOOD RESIDUE CHIPS	0,002850796	t/TJ
2017	PM 10	1A2e	ANIMAL-BASED FUELS	0,034873249	t/TJ
2017	PM 10	1A2e	COAL (S=1.0%)	0,003072621	t/TJ
2017	PM 10	1A2e	COKE (S=1.0%)	0,039000000	t/TJ
2017	PM 10	1A2e	DIESEL OIL (S=001%)	0,003500000	t/TJ
2017	PM 10	1A2e	FOREST RESIDUE CHIPS	0,052000000	t/TJ

2017	PM 10	1A2e	GASOIL (FOR NON-ROAD USE)	0,000629447	t/TJ
2017	PM 10	1A2e	HEAVY FUEL OIL (S<1%)	0,038413740	t/TJ
2017	PM 10	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,003912922	t/TJ
2017	PM 10	1A2e	MILLED PEAT	0,018338101	t/TJ
2017	PM 10	1A2e	OTHER NON-FOSSIL LIQUID	0,001236534	t/TJ
2017	PM 10	1A2e	PEAT PELLETS AND BRIQUETTES	0,002884590	t/TJ
2017	PM 10	1A2e	SAWDUST AND CUTTER CHIPS	0,039818048	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PM 10	1A2e	FUELS)	0,052000000	t/TJ
2017	PM 10	1A2e	WOOD RESIDUE CHIPS	0,022100000	t/TJ
2017	PM 10	1A2f	CHIPS FROM ROUNDWOOD	0,045889342	t/TJ
2017	PM 10	1A2f	COAL (S=1.0%)	0,019515285	t/TJ
2017	PM 10	1A2f	COKE (S=1.0%)	0,021331014	t/TJ
2017	PM 10	1A2f	DIESEL OIL (S=001%)	16,570124972	t/TJ
2017	PM 10	1A2f	FOREST RESIDUE CHIPS	0,037966538	t/TJ
2017	PM 10	1A2f	GASOIL (FOR NON-ROAD USE)	0,001358181	t/TJ
2017	PM 10	1A2f	HEAVY FUEL OIL (S<1%)	0,032277584	t/TJ
2017	PM 10	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,037605877	t/TJ
2017	PM 10	1A2f	PETROLEUM COKE	0,010598031	t/TJ
2017	PM 10	1A2f	RECOVERED FUEL (REF 2)	0,007724870	t/TJ
2017	PM 10	1A2f	RECYCLED AND WASTE OILS	0,003159240	t/TJ
2017	PM 10	1A2f	RUBBER WASTE	0,014167720	t/TJ
2017	PM 10	1A2f	SAWDUST AND CUTTER CHIPS	0,010086790	t/TJ
2017	PM 10	1A2gvii	DIESEL OIL (S=001%)	0,024122746	t/TJ
2017	PM 10	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,003880783	t/TJ
2017	PM 10	1A2gviii	BARK	0,029738873	t/TJ
2017	PM 10	1A2gviii	CHIPS FROM ROUNDWOOD	0,034937885	t/TJ
2017	PM 10	1A2gviii	COAL (S=1.0%)	0,039000000	t/TJ
2017	PM 10	1A2gviii	DIESEL OIL (S=001%)	0,004030171	t/TJ
2017	PM 10	1A2gviii	FOREST RESIDUE CHIPS	0,020803938	t/TJ
2017	PM 10	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,004720273	t/TJ
2017	PM 10	1A2gviii	HAZARDOUS WASTE	0,000047909	t/TJ
2017	PM 10	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,064500000	t/TJ
2017	PM 10	1A2gviii	HEAVY FUEL OIL (S<1%)	0,028533019	t/TJ
2017	PM 10	1A2gviii	INDUSTRIAL WASTE	0,000377825	t/TJ
2017	PM 10	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,016486677	t/TJ
2017	PM 10	1A2gviii	MILLED PEAT	0,006169576	t/TJ
2017	PM 10	1A2gviii	MUNICIPAL WASTE - unsorted	0,000258083	t/TJ
2017	PM 10	1A2gviii	OTHER FOSSIL LIQUID	0,064500000	t/TJ
2017	PM 10	1A2gviii	OTHER NON-FOSSIL LIQUID	0,064500000	t/TJ
2017	PM 10	1A2gviii	OTHER NON-FOSSIL SOLID	0,002150185	t/TJ
2017	PM 10	1A2gviii	OTHER WOOD RESIDUE	0,018794472	t/TJ
2017	PM 10	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,013839069	t/TJ
2017	PM 10	1A2gviii	RECOVERED FUEL (REF 2)	0,000212872	t/TJ
2017	PM 10	1A2gviii	RECOVERED WOOD	0,000212872	t/TJ
2017	PM 10	1A2gviii	SAWDUST AND CUTTER CHIPS	0,034759901	t/TJ
2017	PM 10	1A2gviii	SOD PEAT	0,003606258	t/TJ
2017	PM 10	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,024931862	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PM 10	1A2gviii	FUELS)	0,044163280	t/TJ
2017	PM 10	1A2gviii	WOOD RESIDUE CHIPS	0,035089248	t/TJ
2017	PM 10	1A3ai(i)	KEROSENE (JET FUEL)	0,002292835	t/TJ
2017	PM 10	1A3aii(i)	AVIATION GASOLINE	0,008000000	t/TJ
2017	PM 10	1A3aii(i)	KEROSENE (JET FUEL)	0,001909831	t/TJ
2017	PM 10	1A3bi	DIESEL OIL (S=001%)	0,008478522	t/TJ
2017	PM 10	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000612308	t/TJ
2017	PM 10	1A3bi	NATURAL GAS	0,000419318	t/TJ

2017	PM 10	1A3bii	DIESEL OIL (S=001%)	0,023337560	t/TJ
2017	PM 10	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000651004	t/TJ
2017	PM 10	1A3bii	NATURAL GAS	0,000454308	t/TJ
2017	PM 10	1A3biii	DIESEL OIL (S=001%)	0,003936061	t/TJ
2017	PM 10	1A3biii	NATURAL GAS	0,000195829	t/TJ
2017	PM 10	1A3biv	DIESEL OIL (S=001%)	0,019358831	t/TJ
2017	PM 10	1A3biv	MOTOR GASOLINE (S=0.001%)	0,020223340	t/TJ
2017	PM 10	1A3c	GASOIL (FOR NON-ROAD USE)	0,031765363	t/TJ
2017	PM 10	1A3dii	DIESEL OIL (S=001%)	0,088558550	t/TJ
2017	PM 10	1A3dii	GASOIL (FOR NON-ROAD USE)	0,028176043	t/TJ
2017	PM 10	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,043789207	t/TJ
2017	PM 10	1A3dii	MOTOR GASOLINE (S=0.001%)	0,122188653	t/TJ
2017	PM 10	1A4ai	FOREST WOODFUEL	0,016371200	t/TJ
2017	PM 10	1A4ai	GASOIL (FOR NON-ROAD USE)	0,003500000	t/TJ
2017	PM 10	1A4ai	HEAVY FUEL OIL (S<1%)	0,077231338	t/TJ
2017	PM 10	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,003502518	t/TJ
2017	PM 10	1A4ai	SOD PEAT	0,093853659	t/TJ
2017	PM 10	1A4aii	DIESEL OIL (S=001%)	0,028390156	t/TJ
2017	PM 10	1A4aii	LIQUID GAS	0,004111785	t/TJ
2017	PM 10	1A4aii	MOTOR GASOLINE (S=0.001%)	0,090654741	t/TJ
2017	PM 10	1A4bi	COAL (S=1.0%)	0,180000000	t/TJ
2017	PM 10	1A4bi	FOREST WOODFUEL	0,176753615	t/TJ
2017	PM 10	1A4bi	HEAVY FUEL OIL (S<1%)	0,055800000	t/TJ
2017	PM 10	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,006300000	t/TJ
2017	PM 10	1A4bi	PARAFFIN	0,006300000	t/TJ
2017	PM 10	1A4bi	SOD PEAT	0,360000000	t/TJ
2017	PM 10	1A4bii	DIESEL OIL (S=001%)	0,091336795	t/TJ
2017	PM 10	1A4bii	MOTOR GASOLINE (S=0.001%)	0,007774325	t/TJ
2017	PM 10	1A4ci	COAL (S=1.0%)	0,017960526	t/TJ
2017	PM 10	1A4ci	FOREST WOODFUEL	0,016000000	t/TJ
2017	PM 10	1A4ci	HEAVY FUEL OIL (S<1%)	0,077400000	t/TJ
2017	PM 10	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,003500000	t/TJ
2017	PM 10	1A4ci	SOD PEAT	0,104000000	t/TJ
2017	PM 10	1A4cii	DIESEL OIL (S=001%)	0,019079630	t/TJ
2017	PM 10	1A4cii	MOTOR GASOLINE (S=0.001%)	0,116689959	t/TJ
2017	PM 10	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,033000000	t/TJ
2017	PM 10	1A5a	FOREST WOODFUEL	0,052000000	t/TJ
2017	PM 10	1A5a	HEAVY FUEL OIL (S<1%)	0,077400000	t/TJ
2017	PM 10	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,005773488	t/TJ
2017	PM 10	1A5a	OTHER PETROLEUM PRODUCTS	0,003500000	t/TJ

## TSP Implied emission factors in Finnish air pollutant inventory for 2017

2017	TSP	1A1a	ANIMAL-BASED FUELS	0,000698296	t/TJ
2017	TSP	1A1a	BARK	0,010312635	t/TJ
2017	TSP	1A1a	CHIPS FROM ROUNDWOOD	0,017962711	t/TJ
2017	TSP	1A1a	COAL (S=1.0%)	0,003844543	t/TJ
2017	TSP	1A1a	DEINKING WASTE	0,000778571	t/TJ
2017	TSP	1A1a	DEMOLITION WOOD	0,001187928	t/TJ
2017	TSP	1A1a	DIESEL OIL (S=001%)	0,020000000	t/TJ
2017	TSP	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,200000000	t/TJ
2017	TSP	1A1a	FOREST RESIDUE CHIPS	0,016241767	t/TJ
2017	TSP	1A1a	GASOIL (FOR NON-ROAD USE)	0,005990716	t/TJ
2017	TSP	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000984208	t/TJ
2017	TSP	1A1a	HEAVY FUEL OIL (S<1%)	0,027266699	t/TJ
2017	TSP	1A1a	INDUSTRIAL WASTE	0,000511529	t/TJ
2017	TSP	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,007508874	t/TJ
2017	TSP	1A1a	LIQUID BIOFUELS	0,002102378	t/TJ
2017	TSP	1A1a	MILLED PEAT	0,004364709	t/TJ
2017	TSP	1A1a	MUNICIPAL WASTE - unsorted	0,000107481	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	TSP	1A1a	INDUSTRY	0,001449146	t/TJ
2017	TSP	1A1a	OTHER FOSSIL LIQUID	0,000120136	t/TJ
2017	TSP	1A1a	OTHER FOSSIL SOLID	0,001129965	t/TJ
2017	TSP	1A1a	OTHER NON-FOSSIL SOLID	0,005459316	t/TJ
2017	TSP	1A1a	OTHER WASTE	0,000896276	t/TJ
2017	TSP	1A1a	OTHER WOOD RESIDUE	0,013639058	t/TJ
2017	TSP	1A1a	PEAT PELLETS AND BRIQUETTES	0,004131384	t/TJ
2017	TSP	1A1a	RECOVERED FUEL (REF 2)	0,003026759	t/TJ
2017	TSP	1A1a	RECOVERED FUEL (REF 3)	0,000302404	t/TJ
2017	TSP	1A1a	RECOVERED WOOD	0,004507696	t/TJ
2017	TSP	1A1a	RECYCLED AND WASTE OILS	0,000762756	t/TJ
2017	TSP	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000120213	t/TJ
2017	TSP	1A1a	SALT TREATED WOOD	0,000544986	t/TJ
2017	TSP	1A1a	SAWDUST AND CUTTER CHIPS	0,012637418	t/TJ
2017	TSP	1A1a	SOD PEAT	0,186192794	t/TJ
2017	TSP	1A1a	TALL PITCH AND OIL	0,074106955	t/TJ
2017	TSP	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,029074386	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	TSP	1A1a	FUELS)	0,017963623	t/TJ
2017	TSP	1A1a	WOOD RESIDUE CHIPS	0,023438716	t/TJ
2017	TSP	1A1b	DIESEL OIL (S=001%)	0,007000000	t/TJ
2017	TSP	1A1b	GASOIL (FOR NON-ROAD USE)	0,002205419	t/TJ
2017	TSP	1A1b	HEAVY FUEL OIL (S<1%)	0,011360556	t/TJ
2017	TSP	1A1b	LIQUID BIOFUELS	0,007000000	t/TJ
2017	TSP	1A1b	OTHER MEDIUM DISTILLATES	0,002139894	t/TJ
2017	TSP	1A1b	PETROLEUM COKE	0,044774149	t/TJ
2017	TSP	1A2a	COKE (S=1.0%)	0,016400276	t/TJ
2017	TSP	1A2a	GASOIL (FOR NON-ROAD USE)	1,417270346	t/TJ
2017	TSP	1A2a	HEAVY FUEL OIL (S<1%)	0,018131661	t/TJ
2017	TSP	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,006857236	t/TJ
2017	TSP	1A2a	LIQUID GAS	0,000000984	t/TJ
2017	TSP	1A2a	MILLED PEAT	0,070422535	t/TJ
2017	TSP	1A2a	OTHER FOSSIL SOLID	0,017501908	t/TJ
2017	TSP	1A2a	OXYGEN STEEL FURNACE GAS	0,000200263	t/TJ
2017	TSP	1A2a	WOOD RESIDUE CHIPS	0,070422535	t/TJ
2017	TSP	1A2b	COAL (S=1.0%)	0,083677508	t/TJ
2017	TSP	1A2b	COKE (S=1.0%)	0,020942593	t/TJ



2017	TSP	1A2b	GASOIL (FOR NON-ROAD USE)	0,000977321	t/TJ
2017	TSP	1A2b	HEAVY FUEL OIL (S<1%)	0,014290957	t/TJ
2017	TSP	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,001078335	t/TJ
2017	TSP	1A2b	OTHER FOSSIL SOLID	0,020942593	t/TJ
2017	TSP	1A2b	RECYCLED AND WASTE OILS	0,010471296	t/TJ
2017	TSP	1A2c	COAL (S=1.0%)	0,001874422	t/TJ
2017	TSP	1A2c	GASOIL (FOR NON-ROAD USE)	0,004405431	t/TJ
2017	TSP	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,006726457	t/TJ
2017	TSP	1A2c	HEAVY FUEL OIL (S<1%)	0,041288908	t/TJ
2017	TSP	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,006638156	t/TJ
2017	TSP	1A2c	OTHER FOSSIL LIQUID	0,075000000	t/TJ
2017	TSP	1A2c	OTHER MEDIUM DISTILLATES	0,007000000	t/TJ
2017	TSP	1A2c	PETROLEUM COKE	0,003875456	t/TJ
2017	TSP	1A2c	TALL PITCH AND OIL WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,039724859	t/TJ
2017	TSP	1A2c	FUELS)	0,000745587	t/TJ
2017	TSP	1A2d	ANIMAL-BASED FUELS	0,001396920	t/TJ
2017	TSP	1A2d	BARK	0,004479804	t/TJ
2017	TSP	1A2d	BLACK LIQUOR	0,012055308	t/TJ
2017	TSP	1A2d	CHIPS FROM ROUNDWOOD	0,003388739	t/TJ
2017	TSP	1A2d	COAL (S=1.0%)	0,000764536	t/TJ
2017	TSP	1A2d	DEMOLITION WOOD	0,001116817	t/TJ
2017	TSP	1A2d	FOREST RESIDUE CHIPS	0,004585459	t/TJ
2017	TSP	1A2d	GASOIL (FOR NON-ROAD USE)	0,028119083	t/TJ
2017	TSP	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,011755671	t/TJ
2017	TSP	1A2d	HEAVY FUEL OIL (S<1%)	0,020395332	t/TJ
2017	TSP	1A2d	HYDROGEN	0,028531666	t/TJ
2017	TSP	1A2d	INDUSTRIAL BIOGAS	0,021382224	t/TJ
2017	TSP	1A2d	INDUSTRIAL WASTE	0,200000000	t/TJ
2017	TSP	1A2d	LIGHT FUEL OIL (S=0.0915%)	0,005741798	t/TJ
2017	TSP	1A2d	LIQUID BIOFUELS	0,004099430	t/TJ
2017	TSP	1A2d	LIQUID GAS	0,000000742	t/TJ
2017	TSP	1A2d	METHANOL	0,012584353	t/TJ
2017	TSP	1A2d	MILLED PEAT	0,004507934	t/TJ
2017	TSP	1A2d	NATURAL GAS OTHER BY-PRODUCTS FROM WOOD PROCESSING INDUSTRY	0,000959445	t/TJ
2017	TSP	1A2d	INDUSTRY	0,006100277	t/TJ
2017	TSP	1A2d	OTHER NON-FOSSIL SOLID	0,000567447	t/TJ
2017	TSP	1A2d	OTHER WASTE	0,000855268	t/TJ
2017	TSP	1A2d	OTHER WOOD RESIDUE	0,104249003	t/TJ
2017	TSP	1A2d	PLASTIC WASTE	0,024053540	t/TJ
2017	TSP	1A2d	RECOVERED FUEL (REF 2)	0,003163482	t/TJ
2017	TSP	1A2d	RECOVERED WOOD	0,000907861	t/TJ
2017	TSP	1A2d	RECYCLED AND WASTE OILS	0,001116817	t/TJ
2017	TSP	1A2d	SALT TREATED WOOD	0,001116817	t/TJ
2017	TSP	1A2d	SAWDUST AND CUTTER CHIPS	0,006076065	t/TJ
2017	TSP	1A2d	SOD PEAT	0,005057340	t/TJ
2017	TSP	1A2d	SULPHUR CONCENTRATE	0,035979961	t/TJ
2017	TSP	1A2d	TALL PITCH AND OIL	0,009987935	t/TJ
2017	TSP	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,022826149	t/TJ
2017	TSP	1A2d	WOOD RESIDUE CHIPS	0,003269177	t/TJ
2017	TSP	1A2e	ANIMAL-BASED FUELS	0,134127880	t/TJ
2017	TSP	1A2e	COAL (S=1.0%)	0,004727109	t/TJ
2017	TSP	1A2e	COKE (S=1.0%)	0,150000000	t/TJ
2017	TSP	1A2e	DIESEL OIL (S=001%)	0,007000000	t/TJ
2017	TSP	1A2e	FOREST RESIDUE CHIPS	0,200000000	t/TJ
2017	TSP	1A2e	GASOIL (FOR NON-ROAD USE)	0,001258893	t/TJ

2017	TSP	1A2e	HEAVY FUEL OIL (S<1%)	0,044410453	t/TJ
2017	TSP	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,007825843	t/TJ
2017	TSP	1A2e	MILLED PEAT	0,069218067	t/TJ
2017	TSP	1A2e	OTHER NON-FOSSIL LIQUID	0,001437830	t/TJ
2017	TSP	1A2e	PEAT PELLETS AND BRIQUETTES	0,007132229	t/TJ
2017	TSP	1A2e	SAWDUST AND CUTTER CHIPS	0,153146338	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	TSP	1A2e	FUELS)	0,200000000	t/TJ
2017	TSP	1A2e	WOOD RESIDUE CHIPS	0,085000000	t/TJ
2017	TSP	1A2f	CHIPS FROM ROUNDWOOD	0,176497468	t/TJ
2017	TSP	1A2f	COAL (S=1.0%)	0,062467752	t/TJ
2017	TSP	1A2f	COKE (S=1.0%)	0,082042361	t/TJ
2017	TSP	1A2f	DIESEL OIL (S=001%)	0,004391499	t/TJ
2017	TSP	1A2f	FOREST RESIDUE CHIPS	0,146025146	t/TJ
2017	TSP	1A2f	GASOIL (FOR NON-ROAD USE)	0,002802563	t/TJ
2017	TSP	1A2f	HEAVY FUEL OIL (S<1%)	0,036034736	t/TJ
2017	TSP	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,027585540	t/TJ
2017	TSP	1A2f	PETROLEUM COKE	0,013387032	t/TJ
2017	TSP	1A2f	RECOVERED FUEL (REF 2)	0,012030806	t/TJ
2017	TSP	1A2f	RECYCLED AND WASTE OILS	0,003917428	t/TJ
2017	TSP	1A2f	RUBBER WASTE	0,015072042	t/TJ
2017	TSP	1A2f	SAWDUST AND CUTTER CHIPS	0,029673339	t/TJ
2017	TSP	1A2gvii	DIESEL OIL (S=001%)	0,024122746	t/TJ
2017	TSP	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,003880783	t/TJ
2017	TSP	1A2gviii	BARK	0,063395562	t/TJ
2017	TSP	1A2gviii	CHIPS FROM ROUNDWOOD	0,109884721	t/TJ
2017	TSP	1A2gviii	COAL (S=1.0%)	0,150000000	t/TJ
2017	TSP	1A2gviii	DIESEL OIL (S=001%)	0,006969944	t/TJ
2017	TSP	1A2gviii	FOREST RESIDUE CHIPS	0,043083030	t/TJ
2017	TSP	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,009440547	t/TJ
2017	TSP	1A2gviii	HAZARDOUS WASTE	0,000184265	t/TJ
2017	TSP	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,075000000	t/TJ
2017	TSP	1A2gviii	HEAVY FUEL OIL (S<1%)	0,033626180	t/TJ
2017	TSP	1A2gviii	INDUSTRIAL WASTE	0,000501538	t/TJ
2017	TSP	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,023576011	t/TJ
2017	TSP	1A2gviii	MILLED PEAT	0,007415588	t/TJ
2017	TSP	1A2gviii	MUNICIPAL WASTE - unsorted	0,000332292	t/TJ
2017	TSP	1A2gviii	OTHER FOSSIL LIQUID	0,075000000	t/TJ
2017	TSP	1A2gviii	OTHER NON-FOSSIL LIQUID	0,075000000	t/TJ
2017	TSP	1A2gviii	OTHER NON-FOSSIL SOLID	0,002976031	t/TJ
2017	TSP	1A2gviii	OTHER WOOD RESIDUE	0,063923214	t/TJ
2017	TSP	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,016091941	t/TJ
2017	TSP	1A2gviii	RECOVERED FUEL (REF 2)	0,000818738	t/TJ
2017	TSP	1A2gviii	RECOVERED WOOD	0,000818738	t/TJ
2017	TSP	1A2gviii	SAWDUST AND CUTTER CHIPS	0,069458656	t/TJ
2017	TSP	1A2gviii	SOD PEAT	0,011763676	t/TJ
2017	TSP	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,060895973	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	TSP	1A2gviii	FUELS)	0,165385609	t/TJ
2017	TSP	1A2gviii	WOOD RESIDUE CHIPS	0,094738967	t/TJ
2017	TSP	1A3ai(i)	KEROSENE (JET FUEL)	0,002292835	t/TJ
2017	TSP	1A3aii(i)	AVIATION GASOLINE	0,008000000	t/TJ
2017	TSP	1A3aii(i)	KEROSENE (JET FUEL)	0,001909831	t/TJ
2017	TSP	1A3bi	DIESEL OIL (S=001%)	0,008478522	t/TJ
2017	TSP	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000612308	t/TJ
2017	TSP	1A3bi	NATURAL GAS	0,000419318	t/TJ
2017	TSP	1A3bii	DIESEL OIL (S=001%)	0,023337560	t/TJ

2017	TSP	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000651004	t/TJ
2017	TSP	1A3bii	NATURAL GAS	0,000454308	t/TJ
2017	TSP	1A3biii	DIESEL OIL (S=001%)	0,003936061	t/TJ
2017	TSP	1A3biii	NATURAL GAS	0,000195829	t/TJ
2017	TSP	1A3biv	DIESEL OIL (S=001%)	0,019358831	t/TJ
2017	TSP	1A3biv	MOTOR GASOLINE (S=0.001%)	0,020223340	t/TJ
2017	TSP	1A3c	GASOIL (FOR NON-ROAD USE)	0,033530106	t/TJ
2017	TSP	1A3dii	DIESEL OIL (S=001%)	0,089453081	t/TJ
2017	TSP	1A3dii	GASOIL (FOR NON-ROAD USE)	0,028460650	t/TJ
2017	TSP	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,044231523	t/TJ
2017	TSP	1A3dii	MOTOR GASOLINE (S=0.001%)	0,123422882	t/TJ
2017	TSP	1A4ai	FOREST WOODFUEL	0,017053333	t/TJ
2017	TSP	1A4ai	GASOIL (FOR NON-ROAD USE)	0,007000000	t/TJ
2017	TSP	1A4ai	HEAVY FUEL OIL (S<1%)	0,089803882	t/TJ
2017	TSP	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,007005035	t/TJ
2017	TSP	1A4ai	SOD PEAT	0,360975610	t/TJ
2017	TSP	1A4aii	DIESEL OIL (S=001%)	0,028390156	t/TJ
2017	TSP	1A4aii	LIQUID GAS	0,004111785	t/TJ
2017	TSP	1A4aii	MOTOR GASOLINE (S=0.001%)	0,090654741	t/TJ
2017	TSP	1A4bi	COAL (S=1.0%)	0,200000000	t/TJ
2017	TSP	1A4bi	FOREST WOODFUEL	0,184118349	t/TJ
2017	TSP	1A4bi	HEAVY FUEL OIL (S<1%)	0,090000000	t/TJ
2017	TSP	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,007000000	t/TJ
2017	TSP	1A4bi	PARAFFIN	0,007000000	t/TJ
2017	TSP	1A4bi	SOD PEAT	0,400000000	t/TJ
2017	TSP	1A4bii	DIESEL OIL (S=001%)	0,091336795	t/TJ
2017	TSP	1A4bii	MOTOR GASOLINE (S=0.001%)	0,007774325	t/TJ
2017	TSP	1A4ci	COAL (S=1.0%)	0,035000000	t/TJ
2017	TSP	1A4ci	FOREST WOODFUEL	0,016666667	t/TJ
2017	TSP	1A4ci	HEAVY FUEL OIL (S<1%)	0,090000000	t/TJ
2017	TSP	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,007000000	t/TJ
2017	TSP	1A4ci	SOD PEAT	0,400000000	t/TJ
2017	TSP	1A4cii	DIESEL OIL (S=001%)	0,019079630	t/TJ
2017	TSP	1A4cii	MOTOR GASOLINE (S=0.001%)	0,116689959	t/TJ
2017	TSP	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,033333333	t/TJ
2017	TSP	1A5a	FOREST WOODFUEL	0,200000000	t/TJ
2017	TSP	1A5a	HEAVY FUEL OIL (S<1%)	0,090000000	t/TJ
2017	TSP	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,009294894	t/TJ
2017	TSP	1A5a	OTHER PETROLEUM PRODUCTS	0,007000000	t/TJ

## BC Implied emission factors in Finnish air pollutant inventory for 2017

2017	BC	1A1a	ANIMAL-BASED FUELS	0,000053755	t/TJ
2017	BC	1A1a	BARK	0,000053323	t/TJ
2017	BC	1A1a	CHIPS FROM ROUNDWOOD	0,000151560	t/TJ
2017	BC	1A1a	COAL (S=1.0%)	0,000014397	t/TJ
2017	BC	1A1a	DEMOLITION WOOD	0,000012298	t/TJ
2017	BC	1A1a	DIESEL OIL (S=001%)	0,000804000	t/TJ
2017	BC	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,005082000	t/TJ
2017	BC	1A1a	FOREST RESIDUE CHIPS	0,000061384	t/TJ
2017	BC	1A1a	GASOIL (FOR NON-ROAD USE)	0,000271528	t/TJ
2017	BC	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000095460	t/TJ
2017	BC	1A1a	HEAVY FUEL OIL (S<1%)	0,004313479	t/TJ
2017	BC	1A1a	INDUSTRIAL WASTE	0,000005550	t/TJ
2017	BC	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,000312231	t/TJ
2017	BC	1A1a	LIQUID BIOFUELS	0,000008325	t/TJ
2017	BC	1A1a	MILLED PEAT	0,000034022	t/TJ
2017	BC	1A1a	MUNICIPAL WASTE - unsorted	0,000000089	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	BC	1A1a	INDUSTRY	0,000011158	t/TJ
2017	BC	1A1a	OTHER FOSSIL LIQUID	0,000027014	t/TJ
2017	BC	1A1a	OTHER FOSSIL SOLID	0,000006212	t/TJ
2017	BC	1A1a	OTHER NON-FOSSIL SOLID	0,000025438	t/TJ
2017	BC	1A1a	OTHER WASTE	0,000029630	t/TJ
2017	BC	1A1a	OTHER WOOD RESIDUE	0,000077664	t/TJ
2017	BC	1A1a	PEAT PELLETS AND BRIQUETTES	0,000031812	t/TJ
2017	BC	1A1a	RECOVERED FUEL (REF 2)	0,000021284	t/TJ
2017	BC	1A1a	RECOVERED FUEL (REF 3)	0,000000302	t/TJ
2017	BC	1A1a	RECOVERED WOOD	0,000053141	t/TJ
2017	BC	1A1a	RECYCLED AND WASTE OILS	0,000163386	t/TJ
2017	BC	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000000801	t/TJ
2017	BC	1A1a	SALT TREATED WOOD	0,000006002	t/TJ
2017	BC	1A1a	SAWDUST AND CUTTER CHIPS	0,000092198	t/TJ
2017	BC	1A1a	SOD PEAT	0,000313546	t/TJ
2017	BC	1A1a	TALL PITCH AND OIL	0,002323994	t/TJ
2017	BC	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000061224	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	BC	1A1a	FUELS)	0,000092877	t/TJ
2017	BC	1A1a	WOOD RESIDUE CHIPS	0,000096981	t/TJ
2017	BC	1A1b	DIESEL OIL (S=001%)	0,000281400	t/TJ
2017	BC	1A1b	GASOIL (FOR NON-ROAD USE)	0,000088658	t/TJ
2017	BC	1A1b	HEAVY FUEL OIL (S<1%)	0,000843897	t/TJ
2017	BC	1A1b	LIQUID BIOFUELS	0,000027720	t/TJ
2017	BC	1A1b	OTHER MEDIUM DISTILLATES	0,000077036	t/TJ
2017	BC	1A1b	PETROLEUM COKE	0,000044774	t/TJ
2017	BC	1A2a	COKE (S=1.0%)	0,000024624	t/TJ
2017	BC	1A2a	GASOIL (FOR NON-ROAD USE)	0,056974272	t/TJ
2017	BC	1A2a	HEAVY FUEL OIL (S<1%)	0,001494404	t/TJ
2017	BC	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,000478220	t/TJ
2017	BC	1A2a	LIQUID GAS	0,000000011	t/TJ
2017	BC	1A2a	MILLED PEAT	0,000116197	t/TJ
2017	BC	1A2a	OTHER FOSSIL LIQUID	0,066833106	t/TJ
2017	BC	1A2a	OTHER FOSSIL SOLID	0,000096721	t/TJ
2017	BC	1A2a	OXYGEN STEEL FURNACE GAS	0,000002229	t/TJ
2017	BC	1A2a	WOOD RESIDUE CHIPS	0,000116197	t/TJ
2017	BC	1A2b	COAL (S=1.0%)	0,000092045	t/TJ
2017	BC	1A2b	COKE (S=1.0%)	0,000020943	t/TJ

2017	BC	1A2b	GASOIL (FOR NON-ROAD USE)	0,000039288	t/TJ
2017	BC	1A2b	HEAVY FUEL OIL (S<1%)	0,002343197	t/TJ
2017	BC	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,000043349	t/TJ
2017	BC	1A2b	OTHER FOSSIL SOLID	0,000023037	t/TJ
2017	BC	1A2b	RECYCLED AND WASTE OILS	0,001964415	t/TJ
2017	BC	1A2c	COAL (S=1.0%)	0,000010309	t/TJ
2017	BC	1A2c	GASOIL (FOR NON-ROAD USE)	0,000177098	t/TJ
2017	BC	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,001130045	t/TJ
2017	BC	1A2c	HEAVY FUEL OIL (S<1%)	0,006944521	t/TJ
2017	BC	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,000700914	t/TJ
2017	BC	1A2c	OTHER FOSSIL LIQUID	0,002352000	t/TJ
2017	BC	1A2c	OTHER MEDIUM DISTILLATES	0,000252000	t/TJ
2017	BC	1A2c	PETROLEUM COKE	0,000003875	t/TJ
2017	BC	1A2c	TALL PITCH AND OIL WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,001245772	t/TJ
2017	BC	1A2c	FUELS)	0,000007978	t/TJ
2017	BC	1A2d	ANIMAL-BASED FUELS	0,000285354	t/TJ
2017	BC	1A2d	BARK	0,000047610	t/TJ
2017	BC	1A2d	CHIPS FROM ROUNDWOOD	0,000080017	t/TJ
2017	BC	1A2d	COAL (S=1.0%)	0,000004205	t/TJ
2017	BC	1A2d	DEMOLITION WOOD	0,000012285	t/TJ
2017	BC	1A2d	FOREST RESIDUE CHIPS	0,000033933	t/TJ
2017	BC	1A2d	GASOIL (FOR NON-ROAD USE)	0,005238785	t/TJ
2017	BC	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,000732591	t/TJ
2017	BC	1A2d	HEAVY FUEL OIL (S<1%)	0,000881957	t/TJ
2017	BC	1A2d	INDUSTRIAL BIOGAS	0,001295648	t/TJ
2017	BC	1A2d	INDUSTRIAL WASTE	0,001200000	t/TJ
2017	BC	1A2d	LIGHT FUEL OIL (S=0.0915%)	0,000257753	t/TJ
2017	BC	1A2d	LIQUID BIOFUELS	0,000020643	t/TJ
2017	BC	1A2d	LIQUID GAS	0,000000022	t/TJ
2017	BC	1A2d	METHANOL	0,000196169	t/TJ
2017	BC	1A2d	MILLED PEAT	0,000049809	t/TJ
2017	BC	1A2d	NATURAL GAS	0,000047010	t/TJ
2017	BC	1A2d	OTHER BY-PRODUCTS FROM WOOD PROCESSING INDUSTRY	0,000025194	t/TJ
2017	BC	1A2d	INDUSTRY	0,000025194	t/TJ
2017	BC	1A2d	OTHER NON-FOSSIL SOLID	0,000005770	t/TJ
2017	BC	1A2d	OTHER WASTE	0,000096376	t/TJ
2017	BC	1A2d	OTHER WOOD RESIDUE	0,000190335	t/TJ
2017	BC	1A2d	PLASTIC WASTE	0,001770695	t/TJ
2017	BC	1A2d	RECOVERED FUEL (REF 2)	0,000010386	t/TJ
2017	BC	1A2d	RECOVERED WOOD	0,000010002	t/TJ
2017	BC	1A2d	RECYCLED AND WASTE OILS	0,000251131	t/TJ
2017	BC	1A2d	SALT TREATED WOOD	0,000012285	t/TJ
2017	BC	1A2d	SAWDUST AND CUTTER CHIPS	0,000133077	t/TJ
2017	BC	1A2d	SOD PEAT	0,000019140	t/TJ
2017	BC	1A2d	TALL PITCH AND OIL	0,000636136	t/TJ
2017	BC	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000043588	t/TJ
2017	BC	1A2d	WOOD RESIDUE CHIPS	0,000052565	t/TJ
2017	BC	1A2e	ANIMAL-BASED FUELS	0,004828604	t/TJ
2017	BC	1A2e	COAL (S=1.0%)	0,000013000	t/TJ
2017	BC	1A2e	COKE (S=1.0%)	0,000150000	t/TJ
2017	BC	1A2e	DIESEL OIL (S=001%)	0,000281400	t/TJ
2017	BC	1A2e	FOREST RESIDUE CHIPS	0,000330000	t/TJ
2017	BC	1A2e	GASOIL (FOR NON-ROAD USE)	0,000050608	t/TJ
2017	BC	1A2e	HEAVY FUEL OIL (S<1%)	0,007504080	t/TJ
2017	BC	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,000314599	t/TJ
2017	BC	1A2e	MILLED PEAT	0,000116376	t/TJ

2017	BC	1A2e	OTHER NON-FOSSIL LIQUID	0,000026571	t/TJ
2017	BC	1A2e	PEAT PELLETS AND BRIQUETTES	0,000018306	t/TJ
2017	BC	1A2e	SAWDUST AND CUTTER CHIPS	0,000252691	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	BC	1A2e	FUELS)	0,000330000	t/TJ
2017	BC	1A2e	WOOD RESIDUE CHIPS	0,000140250	t/TJ
2017	BC	1A2f	CHIPS FROM ROUNDWOOD	0,000291221	t/TJ
2017	BC	1A2f	COAL (S=1.0%)	0,000136653	t/TJ
2017	BC	1A2f	COKE (S=1.0%)	0,000082042	t/TJ
2017	BC	1A2f	DIESEL OIL (S=001%)	1,332238048	t/TJ
2017	BC	1A2f	FOREST RESIDUE CHIPS	0,000240941	t/TJ
2017	BC	1A2f	GASOIL (FOR NON-ROAD USE)	0,000123492	t/TJ
2017	BC	1A2f	HEAVY FUEL OIL (S<1%)	0,006047910	t/TJ
2017	BC	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,004527863	t/TJ
2017	BC	1A2f	PETROLEUM COKE	0,000149617	t/TJ
2017	BC	1A2f	RECOVERED FUEL (REF 2)	0,000097777	t/TJ
2017	BC	1A2f	RECYCLED AND WASTE OILS	0,000645473	t/TJ
2017	BC	1A2f	RUBBER WASTE	0,003584885	t/TJ
2017	BC	1A2f	SAWDUST AND CUTTER CHIPS	0,000121739	t/TJ
2017	BC	1A2gvii	DIESEL OIL (S=001%)	0,014956103	t/TJ
2017	BC	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,000194039	t/TJ
2017	BC	1A2gviii	BARK	0,000346372	t/TJ
2017	BC	1A2gviii	CHIPS FROM ROUNDWOOD	0,000415037	t/TJ
2017	BC	1A2gviii	COAL (S=1.0%)	0,000165000	t/TJ
2017	BC	1A2gviii	DIESEL OIL (S=001%)	0,000358467	t/TJ
2017	BC	1A2gviii	FOREST RESIDUE CHIPS	0,000389384	t/TJ
2017	BC	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,000832512	t/TJ
2017	BC	1A2gviii	HAZARDOUS WASTE	0,000003086	t/TJ
2017	BC	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,011031429	t/TJ
2017	BC	1A2gviii	HEAVY FUEL OIL (S<1%)	0,005508569	t/TJ
2017	BC	1A2gviii	INDUSTRIAL WASTE	0,000010532	t/TJ
2017	BC	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,001341566	t/TJ
2017	BC	1A2gviii	MILLED PEAT	0,000042048	t/TJ
2017	BC	1A2gviii	MUNICIPAL WASTE - unsorted	0,000000888	t/TJ
2017	BC	1A2gviii	OTHER FOSSIL LIQUID	0,014070000	t/TJ
2017	BC	1A2gviii	OTHER NON-FOSSIL LIQUID	0,001386000	t/TJ
2017	BC	1A2gviii	OTHER NON-FOSSIL SOLID	0,000045148	t/TJ
2017	BC	1A2gviii	OTHER WOOD RESIDUE	0,000119273	t/TJ
2017	BC	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,000504643	t/TJ
2017	BC	1A2gviii	RECOVERED FUEL (REF 2)	0,000000819	t/TJ
2017	BC	1A2gviii	RECOVERED WOOD	0,000001351	t/TJ
2017	BC	1A2gviii	SAWDUST AND CUTTER CHIPS	0,000598426	t/TJ
2017	BC	1A2gviii	SOD PEAT	0,000025219	t/TJ
2017	BC	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000343689	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	BC	1A2gviii	FUELS)	0,000383460	t/TJ
2017	BC	1A2gviii	WOOD RESIDUE CHIPS	0,000258764	t/TJ
2017	BC	1A3ai(i)	KEROSENE (JET FUEL)	0,001146418	t/TJ
2017	BC	1A3aii(i)	AVIATION GASOLINE	0,004000000	t/TJ
2017	BC	1A3aii(i)	KEROSENE (JET FUEL)	0,000954916	t/TJ
2017	BC	1A3bi	DIESEL OIL (S=001%)	0,004832758	t/TJ
2017	BC	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000073477	t/TJ
2017	BC	1A3bii	DIESEL OIL (S=001%)	0,012835658	t/TJ
2017	BC	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000032550	t/TJ
2017	BC	1A3biii	DIESEL OIL (S=001%)	0,002086112	t/TJ
2017	BC	1A3biv	DIESEL OIL (S=001%)	0,011034534	t/TJ
2017	BC	1A3biv	MOTOR GASOLINE (S=0.001%)	0,002224567	t/TJ

2017	BC	1A3c	GASOIL (FOR NON-ROAD USE)	0,019643789	t/TJ
2017	BC	1A3dii	DIESEL OIL (S=001%)	0,027730455	t/TJ
2017	BC	1A3dii	GASOIL (FOR NON-ROAD USE)	0,008822801	t/TJ
2017	BC	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,005307783	t/TJ
2017	BC	1A3dii	MOTOR GASOLINE (S=0.001%)	0,006171144	t/TJ
2017	BC	1A4ai	FOREST WOODFUEL	0,000508700	t/TJ
2017	BC	1A4ai	GASOIL (FOR NON-ROAD USE)	0,000281400	t/TJ
2017	BC	1A4ai	HEAVY FUEL OIL (S<1%)	0,015087052	t/TJ
2017	BC	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,000281602	t/TJ
2017	BC	1A4ai	SOD PEAT	0,000595610	t/TJ
2017	BC	1A4aii	DIESEL OIL (S=001%)	0,011639964	t/TJ
2017	BC	1A4aii	LIQUID GAS	0,000616768	t/TJ
2017	BC	1A4aii	MOTOR GASOLINE (S=0.001%)	0,004532737	t/TJ
2017	BC	1A4bi	COAL (S=1.0%)	0,003520000	t/TJ
2017	BC	1A4bi	FOREST WOODFUEL	0,049636134	t/TJ
2017	BC	1A4bi	HEAVY FUEL OIL (S<1%)	0,006210000	t/TJ
2017	BC	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,001641500	t/TJ
2017	BC	1A4bi	PARAFFIN	0,003528000	t/TJ
2017	BC	1A4bi	SOD PEAT	0,010560000	t/TJ
2017	BC	1A4bii	DIESEL OIL (S=001%)	0,037448086	t/TJ
2017	BC	1A4bii	MOTOR GASOLINE (S=0.001%)	0,000388716	t/TJ
2017	BC	1A4ci	COAL (S=1.0%)	0,000075987	t/TJ
2017	BC	1A4ci	FOREST WOODFUEL	0,000500000	t/TJ
2017	BC	1A4ci	HEAVY FUEL OIL (S<1%)	0,015120000	t/TJ
2017	BC	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,000281400	t/TJ
2017	BC	1A4ci	SOD PEAT	0,000660000	t/TJ
2017	BC	1A4cii	DIESEL OIL (S=001%)	0,010953370	t/TJ
2017	BC	1A4cii	MOTOR GASOLINE (S=0.001%)	0,005834498	t/TJ
2017	BC	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,010333333	t/TJ
2017	BC	1A5a	FOREST WOODFUEL	0,002800000	t/TJ
2017	BC	1A5a	HEAVY FUEL OIL (S<1%)	0,015120000	t/TJ
2017	BC	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,001008247	t/TJ
2017	BC	1A5a	OTHER PETROLEUM PRODUCTS	0,000047040	t/TJ

## CO Implied emission factors in Finnish air pollutant inventory for 2017

2017	CO	1A1a	ANIMAL-BASED FUELS	0,023965489	t/TJ
2017	CO	1A1a	BARK	0,101120206	t/TJ
2017	CO	1A1a	BIOGAS FROM WASTEWATER TREATMENT	0,020000000	t/TJ
2017	CO	1A1a	BLAST FURNACE GAS	0,020000000	t/TJ
2017	CO	1A1a	CHIPS FROM ROUNDWOOD	0,108673777	t/TJ
2017	CO	1A1a	COAL (S=1.0%)	0,013985683	t/TJ
2017	CO	1A1a	COKE OVEN GAS	0,020000000	t/TJ
2017	CO	1A1a	DEINKING WASTE	0,019710600	t/TJ
2017	CO	1A1a	DEMOLITION WOOD	0,026583197	t/TJ
2017	CO	1A1a	DIESEL OIL (S=001%)	0,046000000	t/TJ
2017	CO	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,500000000	t/TJ
2017	CO	1A1a	FOREST RESIDUE CHIPS	0,113590690	t/TJ
2017	CO	1A1a	GASOIL (FOR NON-ROAD USE)	0,036765149	t/TJ
2017	CO	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,004912395	t/TJ
2017	CO	1A1a	HEAVY FUEL OIL (S<1%)	0,028478292	t/TJ
2017	CO	1A1a	HYDROGEN	0,020000000	t/TJ
2017	CO	1A1a	INDUSTRIAL BIOGAS	0,236752851	t/TJ
2017	CO	1A1a	INDUSTRIAL WASTE	0,009279064	t/TJ
2017	CO	1A1a	LANDFILL GAS	0,021108134	t/TJ
2017	CO	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,043646771	t/TJ
2017	CO	1A1a	LIQUID BIOFUELS	0,020846472	t/TJ
2017	CO	1A1a	LIQUID GAS	0,021009681	t/TJ
2017	CO	1A1a	MILLED PEAT	0,043377735	t/TJ
2017	CO	1A1a	MUNICIPAL WASTE - unsorted	0,006844435	t/TJ
2017	CO	1A1a	NATURAL GAS	0,010093636	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	CO	1A1a	INDUSTRY	0,018870690	t/TJ
2017	CO	1A1a	OTHER FOSSIL GAS	0,013049487	t/TJ
2017	CO	1A1a	OTHER FOSSIL LIQUID	0,027685408	t/TJ
2017	CO	1A1a	OTHER FOSSIL SOLID	0,023845215	t/TJ
2017	CO	1A1a	OTHER NON-FOSSIL GAS	0,083273769	t/TJ
2017	CO	1A1a	OTHER NON-FOSSIL SOLID	0,251626158	t/TJ
2017	CO	1A1a	OTHER WASTE	0,026888283	t/TJ
2017	CO	1A1a	OTHER WOOD RESIDUE	0,174323187	t/TJ
2017	CO	1A1a	OXYGEN STEEL FURNACE GAS	0,030000000	t/TJ
2017	CO	1A1a	PEAT PELLETS AND BRIQUETTES	0,069688672	t/TJ
2017	CO	1A1a	RECOVERED FUEL (REF 2)	0,013527478	t/TJ
2017	CO	1A1a	RECOVERED FUEL (REF 3)	0,002832516	t/TJ
2017	CO	1A1a	RECOVERED WOOD	0,038765452	t/TJ
2017	CO	1A1a	RECYCLED AND WASTE OILS	0,020160453	t/TJ
2017	CO	1A1a	REFINERY GAS	0,250000000	t/TJ
2017	CO	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000410137	t/TJ
2017	CO	1A1a	SALT TREATED WOOD	0,011562172	t/TJ
2017	CO	1A1a	SAWDUST AND CUTTER CHIPS	0,100942444	t/TJ
2017	CO	1A1a	SOD PEAT	0,104353473	t/TJ
2017	CO	1A1a	TALL PITCH AND OIL	0,436075143	t/TJ
2017	CO	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,195082739	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	CO	1A1a	FUELS)	0,210194068	t/TJ
2017	CO	1A1a	WOOD RESIDUE CHIPS	0,175715233	t/TJ
2017	CO	1A1b	DIESEL OIL (S=001%)	0,020000000	t/TJ
2017	CO	1A1b	GASOIL (FOR NON-ROAD USE)	0,020126252	t/TJ
2017	CO	1A1b	HEAVY FUEL OIL (S<1%)	0,020130742	t/TJ
2017	CO	1A1b	LIQUID BIOFUELS	0,020000000	t/TJ
2017	CO	1A1b	LIQUID GAS	0,038649538	t/TJ



2017	CO	1A1b	NATURAL GAS	0,020253503	t/TJ
2017	CO	1A1b	OTHER FOSSIL GAS	0,020000000	t/TJ
2017	CO	1A1b	OTHER MEDIUM DISTILLATES	0,020000000	t/TJ
2017	CO	1A1b	PETROLEUM COKE	0,031494172	t/TJ
2017	CO	1A1b	REFINERY GAS	0,023601987	t/TJ
2017	CO	1A2a	BLAST FURNACE GAS	0,020000000	t/TJ
2017	CO	1A2a	COKE (S=1.0%)	0,783815468	t/TJ
2017	CO	1A2a	COKE OVEN GAS	0,020000000	t/TJ
2017	CO	1A2a	DIESEL OIL (S=001%)	0,020000000	t/TJ
2017	CO	1A2a	GASOIL (FOR NON-ROAD USE)	0,053895360	t/TJ
2017	CO	1A2a	HEAVY FUEL OIL (S<1%)	0,020000000	t/TJ
2017	CO	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,017617401	t/TJ
2017	CO	1A2a	LIQUID GAS	0,018406680	t/TJ
2017	CO	1A2a	MILLED PEAT	0,013145540	t/TJ
2017	CO	1A2a	NATURAL GAS	0,019165410	t/TJ
2017	CO	1A2a	OTHER FOSSIL LIQUID	0,020000000	t/TJ
2017	CO	1A2a	OTHER FOSSIL SOLID	1,500000000	t/TJ
2017	CO	1A2a	OXYGEN STEEL FURNACE GAS	0,057699216	t/TJ
2017	CO	1A2a	WOOD RESIDUE CHIPS	0,013145540	t/TJ
2017	CO	1A2b	COAL (S=1.0%)	0,029862338	t/TJ
2017	CO	1A2b	COKE (S=1.0%)	0,020000000	t/TJ
2017	CO	1A2b	GASOIL (FOR NON-ROAD USE)	0,020000000	t/TJ
2017	CO	1A2b	HEAVY FUEL OIL (S<1%)	0,020000000	t/TJ
2017	CO	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,020279275	t/TJ
2017	CO	1A2b	LIQUID GAS	0,019696791	t/TJ
2017	CO	1A2b	NATURAL GAS	0,020000000	t/TJ
2017	CO	1A2b	OTHER FOSSIL SOLID	0,020000000	t/TJ
2017	CO	1A2b	RECYCLED AND WASTE OILS	0,020000000	t/TJ
2017	CO	1A2c	COAL (S=1.0%)	0,030000000	t/TJ
2017	CO	1A2c	GASOIL (FOR NON-ROAD USE)	0,020000000	t/TJ
2017	CO	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,020118194	t/TJ
2017	CO	1A2c	HEAVY FUEL OIL (S<1%)	0,020000501	t/TJ
2017	CO	1A2c	HYDROGEN	0,020000000	t/TJ
2017	CO	1A2c	INDUSTRIAL BIOGAS	0,020000000	t/TJ
2017	CO	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,020482841	t/TJ
2017	CO	1A2c	LIQUID GAS	0,020005723	t/TJ
2017	CO	1A2c	NATURAL GAS	0,013492818	t/TJ
2017	CO	1A2c	OTHER FOSSIL GAS	0,020000000	t/TJ
2017	CO	1A2c	OTHER FOSSIL LIQUID	0,020000000	t/TJ
2017	CO	1A2c	OTHER MEDIUM DISTILLATES	0,020000000	t/TJ
2017	CO	1A2c	OTHER NON-FOSSIL GAS	0,020000000	t/TJ
2017	CO	1A2c	PETROLEUM COKE	0,020000000	t/TJ
2017	CO	1A2c	REFINERY GAS	0,020000000	t/TJ
2017	CO	1A2c	TALL PITCH AND OIL	0,020000000	t/TJ
2017	CO	1A2c	WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,018753589	t/TJ
2017	CO	1A2d	ANIMAL-BASED FUELS	0,028626553	t/TJ
2017	CO	1A2d	AROMATIC GAS	0,020000000	t/TJ
2017	CO	1A2d	BARK	0,100482008	t/TJ
2017	CO	1A2d	BLACK LIQUOR	0,097252387	t/TJ
2017	CO	1A2d	CHIPS FROM ROUNDWOOD	0,129739037	t/TJ
2017	CO	1A2d	COAL (S=1.0%)	0,007448456	t/TJ
2017	CO	1A2d	DEMOLITION WOOD	0,008673943	t/TJ
2017	CO	1A2d	FOREST RESIDUE CHIPS	0,090772236	t/TJ
2017	CO	1A2d	GASOIL (FOR NON-ROAD USE)	0,100530565	t/TJ
2017	CO	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,036818387	t/TJ
2017	CO	1A2d	HEAVY FUEL OIL (S<1%)	0,064230467	t/TJ

2017	CO	1A2d	HYDROGEN	0,020000000	t/TJ
2017	CO	1A2d	INDUSTRIAL BIOGAS	0,016165028	t/TJ
2017	CO	1A2d	INDUSTRIAL WASTE	0,020000000	t/TJ
2017	CO	1A2d	LANDFILL GAS	0,037319214	t/TJ
2017	CO	1A2d	LIGHT FUEL OIL (S=0.0915%)	0,045176898	t/TJ
2017	CO	1A2d	LIQUID BIOFUELS	0,016080266	t/TJ
2017	CO	1A2d	LIQUID GAS	0,020134651	t/TJ
2017	CO	1A2d	METHANOL	0,065256317	t/TJ
2017	CO	1A2d	MILLED PEAT	0,054270814	t/TJ
2017	CO	1A2d	NATURAL GAS	0,043039184	t/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	CO	1A2d	INDUSTRY	0,140211521	t/TJ
2017	CO	1A2d	OTHER NON-FOSSIL SOLID	0,008320633	t/TJ
2017	CO	1A2d	OTHER WASTE	0,019386168	t/TJ
2017	CO	1A2d	OTHER WOOD RESIDUE	0,380935597	t/TJ
2017	CO	1A2d	PLASTIC WASTE	0,014227372	t/TJ
2017	CO	1A2d	RECOVERED FUEL (REF 2)	0,022050539	t/TJ
2017	CO	1A2d	RECOVERED WOOD	0,033754305	t/TJ
2017	CO	1A2d	RECYCLED AND WASTE OILS	0,008673943	t/TJ
2017	CO	1A2d	SALT TREATED WOOD	0,008673943	t/TJ
2017	CO	1A2d	SAWDUST AND CUTTER CHIPS	0,081368673	t/TJ
2017	CO	1A2d	SOD PEAT	0,011785091	t/TJ
2017	CO	1A2d	SULPHUR CONCENTRATE	0,050000000	t/TJ
2017	CO	1A2d	TALL PITCH AND OIL	0,038629860	t/TJ
2017	CO	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,095313320	t/TJ
2017	CO	1A2d	WOOD RESIDUE CHIPS	0,062669789	t/TJ
2017	CO	1A2e	ANIMAL-BASED FUELS	0,267979977	t/TJ
2017	CO	1A2e	COAL (S=1.0%)	0,030000000	t/TJ
2017	CO	1A2e	COKE (S=1.0%)	0,050000000	t/TJ
2017	CO	1A2e	DIESEL OIL (S=001%)	0,020000000	t/TJ
2017	CO	1A2e	FOREST RESIDUE CHIPS	0,070000000	t/TJ
2017	CO	1A2e	GASOIL (FOR NON-ROAD USE)	0,097970506	t/TJ
2017	CO	1A2e	HEAVY FUEL OIL (S<1%)	0,020000000	t/TJ
2017	CO	1A2e	INDUSTRIAL BIOGAS	0,020000000	t/TJ
2017	CO	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,020802319	t/TJ
2017	CO	1A2e	LIQUID GAS	0,012867962	t/TJ
2017	CO	1A2e	MILLED PEAT	0,090409817	t/TJ
2017	CO	1A2e	NATURAL GAS	0,020000000	t/TJ
2017	CO	1A2e	OTHER NON-FOSSIL LIQUID	0,002041580	t/TJ
2017	CO	1A2e	PEAT PELLETS AND BRIQUETTES	0,100000000	t/TJ
2017	CO	1A2e	SAWDUST AND CUTTER CHIPS	0,245191952	t/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	CO	1A2e	FUELS)	0,400000000	t/TJ
2017	CO	1A2e	WOOD RESIDUE CHIPS	0,500000000	t/TJ
2017	CO	1A2f	CHIPS FROM ROUNDWOOD	0,341750926	t/TJ
2017	CO	1A2f	COAL (S=1.0%)	0,789130566	t/TJ
2017	CO	1A2f	COKE (S=1.0%)	0,000517949	t/TJ
2017	CO	1A2f	COKE OVEN GAS	0,020000000	t/TJ
2017	CO	1A2f	DIESEL OIL (S=001%)	0,020000000	t/TJ
2017	CO	1A2f	FOREST RESIDUE CHIPS	0,400000000	t/TJ
2017	CO	1A2f	GASOIL (FOR NON-ROAD USE)	0,369248788	t/TJ
2017	CO	1A2f	HEAVY FUEL OIL (S<1%)	0,545130188	t/TJ
2017	CO	1A2f	INDUSTRIAL BIOGAS	0,020000000	t/TJ
2017	CO	1A2f	LANDFILL GAS	0,000648921	t/TJ
2017	CO	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,030341335	t/TJ
2017	CO	1A2f	LIQUID GAS	0,015697481	t/TJ
2017	CO	1A2f	NATURAL GAS	0,024152788	t/TJ

2017	CO	1A2f	OXYGEN STEEL FURNACE GAS	0,031988702	t/TJ
2017	CO	1A2f	PETROLEUM COKE	0,959552459	t/TJ
2017	CO	1A2f	RECOVERED FUEL (REF 2)	0,524558658	t/TJ
2017	CO	1A2f	RECYCLED AND WASTE OILS	0,421639257	t/TJ
2017	CO	1A2f	RUBBER WASTE	1,500000000	t/TJ
2017	CO	1A2f	SAWDUST AND CUTTER CHIPS	0,521062792	t/TJ
2017	CO	1A2gvii	DIESEL OIL (S=001%)	0,371331189	t/TJ
2017	CO	1A2gvii	MOTOR GASOLINE (S=0.001%)	22,200460285	t/TJ
2017	CO	1A2gviii	BARK	0,408835314	t/TJ
2017	CO	1A2gviii	BIOGAS FROM WASTEWATER TREATMENT	0,219848907	t/TJ
2017	CO	1A2gviii	CHIPS FROM ROUNDWOOD	0,449800138	t/TJ
2017	CO	1A2gviii	COAL (S=1.0%)	0,100000000	t/TJ
2017	CO	1A2gviii	DIESEL OIL (S=001%)	0,474511440	t/TJ
2017	CO	1A2gviii	FOREST RESIDUE CHIPS	0,465254237	t/TJ
2017	CO	1A2gviii	GASIFIED WASTE	0,025794765	t/TJ
2017	CO	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,033731227	t/TJ
2017	CO	1A2gviii	HAZARDOUS WASTE	0,003298646	t/TJ
2017	CO	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,020000000	t/TJ
2017	CO	1A2gviii	HEAVY FUEL OIL (S<1%)	0,033740613	t/TJ
2017	CO	1A2gviii	INDUSTRIAL BIOGAS	0,020000000	t/TJ
2017	CO	1A2gviii	INDUSTRIAL WASTE	0,150000000	t/TJ
2017	CO	1A2gviii	LANDFILL GAS	0,025742011	t/TJ
2017	CO	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,065818330	t/TJ
2017	CO	1A2gviii	LIQUID GAS	0,025861206	t/TJ
2017	CO	1A2gviii	MILLED PEAT	0,077617088	t/TJ
2017	CO	1A2gviii	MUNICIPAL WASTE - unsorted	0,003138494	t/TJ
2017	CO	1A2gviii	NATURAL GAS	0,047811674	t/TJ
2017	CO	1A2gviii	OTHER FOSSIL LIQUID	0,100000000	t/TJ
2017	CO	1A2gviii	OTHER NON-FOSSIL GAS	0,020000000	t/TJ
2017	CO	1A2gviii	OTHER NON-FOSSIL LIQUID	0,020000000	t/TJ
2017	CO	1A2gviii	OTHER NON-FOSSIL SOLID	0,053762777	t/TJ
2017	CO	1A2gviii	OTHER WOOD RESIDUE	0,472670222	t/TJ
2017	CO	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,025796224	t/TJ
2017	CO	1A2gviii	RECOVERED FUEL (REF 2)	0,011118188	t/TJ
2017	CO	1A2gviii	RECOVERED WOOD	0,011118188	t/TJ
2017	CO	1A2gviii	SAWDUST AND CUTTER CHIPS	0,412181561	t/TJ
2017	CO	1A2gviii	SOD PEAT	0,061734596	t/TJ
2017	CO	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,363051592	t/TJ
2017	CO	1A2gviii	FUELS)	0,353231782	t/TJ
2017	CO	1A2gviii	WOOD RESIDUE CHIPS	0,463451450	t/TJ
2017	CO	1A3ai(i)	KEROSENE (JET FUEL)	0,322023136	t/TJ
2017	CO	1A3aii(i)	AVIATION GASOLINE	18,512365873	t/TJ
2017	CO	1A3aii(i)	KEROSENE (JET FUEL)	0,405978252	t/TJ
2017	CO	1A3bi	DIESEL OIL (S=001%)	0,026585304	t/TJ
2017	CO	1A3bi	MOTOR GASOLINE (S=0.001%)	0,499444913	t/TJ
2017	CO	1A3bi	NATURAL GAS	0,127046861	t/TJ
2017	CO	1A3bii	DIESEL OIL (S=001%)	0,133432720	t/TJ
2017	CO	1A3bii	MOTOR GASOLINE (S=0.001%)	4,049908437	t/TJ
2017	CO	1A3bii	NATURAL GAS	0,137625615	t/TJ
2017	CO	1A3biii	DIESEL OIL (S=001%)	0,059833104	t/TJ
2017	CO	1A3biii	NATURAL GAS	0,037582133	t/TJ
2017	CO	1A3biv	DIESEL OIL (S=001%)	1,631994450	t/TJ
2017	CO	1A3biv	MOTOR GASOLINE (S=0.001%)	3,925119340	t/TJ
2017	CO	1A3c	GASOIL (FOR NON-ROAD USE)	0,211345541	t/TJ
2017	CO	1A3dii	DIESEL OIL (S=001%)	0,389178990	t/TJ
2017	CO	1A3dii	GASOIL (FOR NON-ROAD USE)	0,183316543	t/TJ

2017	CO	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,186777021	t/TJ
2017	CO	1A3dii	MOTOR GASOLINE (S=0.001%)	12,875993715	t/TJ
2017	CO	1A3ei	NATURAL GAS	0,020000000	t/TJ
2017	CO	1A4ai	FOREST WOODFUEL	0,223778000	t/TJ
2017	CO	1A4ai	GASOIL (FOR NON-ROAD USE)	0,020000000	t/TJ
2017	CO	1A4ai	HEAVY FUEL OIL (S<1%)	0,020000000	t/TJ
2017	CO	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,020091542	t/TJ
2017	CO	1A4ai	LIQUID GAS	0,020000000	t/TJ
2017	CO	1A4ai	NATURAL GAS	0,048255025	t/TJ
2017	CO	1A4ai	SOD PEAT	0,180487805	t/TJ
2017	CO	1A4aii	DIESEL OIL (S=001%)	0,361650781	t/TJ
2017	CO	1A4aii	LIQUID GAS	0,952827734	t/TJ
2017	CO	1A4aii	MOTOR GASOLINE (S=0.001%)	18,545821208	t/TJ
2017	CO	1A4bi	COAL (S=1.0%)	0,100000000	t/TJ
2017	CO	1A4bi	FOREST WOODFUEL	3,022058772	t/TJ
2017	CO	1A4bi	HEAVY FUEL OIL (S<1%)	0,020000000	t/TJ
2017	CO	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,020000000	t/TJ
2017	CO	1A4bi	LIQUID GAS	0,050000000	t/TJ
2017	CO	1A4bi	NATURAL GAS	0,050000000	t/TJ
2017	CO	1A4bi	PARAFFIN	0,020000000	t/TJ
2017	CO	1A4bi	SOD PEAT	0,200000000	t/TJ
2017	CO	1A4bii	DIESEL OIL (S=001%)	0,502926918	t/TJ
2017	CO	1A4bii	MOTOR GASOLINE (S=0.001%)	22,609138168	t/TJ
2017	CO	1A4ci	COAL (S=1.0%)	0,050000000	t/TJ
2017	CO	1A4ci	FOREST WOODFUEL	0,233000000	t/TJ
2017	CO	1A4ci	HEAVY FUEL OIL (S<1%)	0,020000000	t/TJ
2017	CO	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,020000000	t/TJ
2017	CO	1A4ci	LIQUID GAS	0,050000000	t/TJ
2017	CO	1A4ci	NATURAL GAS	0,050000000	t/TJ
2017	CO	1A4ci	SOD PEAT	0,200000000	t/TJ
2017	CO	1A4cii	DIESEL OIL (S=001%)	0,302944361	t/TJ
2017	CO	1A4cii	MOTOR GASOLINE (S=0.001%)	17,246644135	t/TJ
2017	CO	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,200000000	t/TJ
2017	CO	1A5a	FOREST WOODFUEL	0,500000000	t/TJ
2017	CO	1A5a	HEAVY FUEL OIL (S<1%)	0,020000000	t/TJ
2017	CO	1A5a	LANDFILL GAS	0,050000000	t/TJ
2017	CO	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,038206360	t/TJ
2017	CO	1A5a	LIQUID GAS	0,050000000	t/TJ
2017	CO	1A5a	NATURAL GAS	0,050000000	t/TJ
2017	CO	1A5a	OTHER PETROLEUM PRODUCTS	0,020000000	t/TJ

## Pb Implied emission factors in Finnish air pollutant inventory for 2017

2017	Pb	1A1a	ANIMAL-BASED FUELS	0,000653571	kg/TJ
2017	Pb	1A1a	BARK	0,008879006	kg/TJ
2017	Pb	1A1a	CHIPS FROM ROUNDWOOD	0,009500618	kg/TJ
2017	Pb	1A1a	COAL (S=1.0%)	0,001349863	kg/TJ
2017	Pb	1A1a	DEINKING WASTE	0,035762523	kg/TJ
2017	Pb	1A1a	DEMOLITION WOOD	0,003424101	kg/TJ
2017	Pb	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,045000000	kg/TJ
2017	Pb	1A1a	FOREST RESIDUE CHIPS	0,009146490	kg/TJ
2017	Pb	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000427133	kg/TJ
2017	Pb	1A1a	HEAVY FUEL OIL (S<1%)	0,017310885	kg/TJ
2017	Pb	1A1a	INDUSTRIAL WASTE	0,001111582	kg/TJ
2017	Pb	1A1a	MILLED PEAT	0,009650348	kg/TJ
2017	Pb	1A1a	MUNICIPAL WASTE - unsorted	0,011516823	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Pb	1A1a	INDUSTRY	0,002518403	kg/TJ
2017	Pb	1A1a	OTHER FOSSIL LIQUID	0,003554075	kg/TJ
2017	Pb	1A1a	OTHER FOSSIL SOLID	0,003889289	kg/TJ
2017	Pb	1A1a	OTHER NON-FOSSIL SOLID	0,012996184	kg/TJ
2017	Pb	1A1a	OTHER WASTE	0,000323035	kg/TJ
2017	Pb	1A1a	OTHER WOOD RESIDUE	0,011121336	kg/TJ
2017	Pb	1A1a	PEAT PELLETS AND BRIQUETTES	0,004913873	kg/TJ
2017	Pb	1A1a	RECOVERED FUEL (REF 2)	0,001649204	kg/TJ
2017	Pb	1A1a	RECOVERED FUEL (REF 3)	0,001048333	kg/TJ
2017	Pb	1A1a	RECOVERED WOOD	0,002155332	kg/TJ
2017	Pb	1A1a	RECYCLED AND WASTE OILS	0,002116562	kg/TJ
2017	Pb	1A1a	REFUSE-DERIVED FUEL (RDF)	0,001046154	kg/TJ
2017	Pb	1A1a	SALT TREATED WOOD	0,003278806	kg/TJ
2017	Pb	1A1a	SAWDUST AND CUTTER CHIPS	0,008243655	kg/TJ
2017	Pb	1A1a	SOD PEAT	0,161002679	kg/TJ
2017	Pb	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,013560364	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Pb	1A1a	FUELS)	0,007494887	kg/TJ
2017	Pb	1A1a	WOOD RESIDUE CHIPS	0,018394482	kg/TJ
2017	Pb	1A1b	HEAVY FUEL OIL (S<1%)	0,010099302	kg/TJ
2017	Pb	1A1b	PETROLEUM COKE	0,790000000	kg/TJ
2017	Pb	1A2a	HEAVY FUEL OIL (S<1%)	0,018789982	kg/TJ
2017	Pb	1A2a	MILLED PEAT	0,170000000	kg/TJ
2017	Pb	1A2a	OTHER FOSSIL LIQUID	0,025000000	kg/TJ
2017	Pb	1A2a	WOOD RESIDUE CHIPS	0,045000000	kg/TJ
2017	Pb	1A2b	HEAVY FUEL OIL (S<1%)	0,002057012	kg/TJ
2017	Pb	1A2c	COAL (S=1.0%)	0,001282431	kg/TJ
2017	Pb	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,025000000	kg/TJ
2017	Pb	1A2c	HEAVY FUEL OIL (S<1%)	0,024905552	kg/TJ
2017	Pb	1A2c	OTHER FOSSIL LIQUID	0,025000000	kg/TJ
2017	Pb	1A2c	PETROLEUM COKE	0,790000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Pb	1A2c	FUELS)	0,028103413	kg/TJ
2017	Pb	1A2d	ANIMAL-BASED FUELS	0,003516752	kg/TJ
2017	Pb	1A2d	BARK	0,005461356	kg/TJ
2017	Pb	1A2d	BLACK LIQUOR	0,024533468	kg/TJ
2017	Pb	1A2d	CHIPS FROM ROUNDWOOD	0,003541980	kg/TJ
2017	Pb	1A2d	COAL (S=1.0%)	0,000801036	kg/TJ
2017	Pb	1A2d	DEMOLITION WOOD	0,003535945	kg/TJ
2017	Pb	1A2d	FOREST RESIDUE CHIPS	0,002156746	kg/TJ
2017	Pb	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,000057442	kg/TJ

2017	Pb	1A2d	HEAVY FUEL OIL (S<1%)	0,005746184	kg/TJ
2017	Pb	1A2d	INDUSTRIAL WASTE	0,045000000	kg/TJ
2017	Pb	1A2d	MILLED PEAT	0,001105530	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Pb	1A2d	INDUSTRY	0,004676993	kg/TJ
2017	Pb	1A2d	OTHER NON-FOSSIL SOLID	0,000527808	kg/TJ
2017	Pb	1A2d	OTHER WASTE	0,003485107	kg/TJ
2017	Pb	1A2d	OTHER WOOD RESIDUE	0,042553533	kg/TJ
2017	Pb	1A2d	PLASTIC WASTE	0,000429750	kg/TJ
2017	Pb	1A2d	RECOVERED FUEL (REF 2)	0,018177638	kg/TJ
2017	Pb	1A2d	RECOVERED WOOD	0,008229188	kg/TJ
2017	Pb	1A2d	RECYCLED AND WASTE OILS	0,004055937	kg/TJ
2017	Pb	1A2d	SALT TREATED WOOD	0,003535945	kg/TJ
2017	Pb	1A2d	SAWDUST AND CUTTER CHIPS	0,015235256	kg/TJ
2017	Pb	1A2d	SOD PEAT	0,003801316	kg/TJ
2017	Pb	1A2d	SULPHUR CONCENTRATE	0,000085752	kg/TJ
2017	Pb	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,009596767	kg/TJ
2017	Pb	1A2d	WOOD RESIDUE CHIPS	0,002174920	kg/TJ
2017	Pb	1A2e	ANIMAL-BASED FUELS	0,045000000	kg/TJ
2017	Pb	1A2e	COAL (S=1.0%)	0,003893991	kg/TJ
2017	Pb	1A2e	COKE (S=1.0%)	0,790000000	kg/TJ
2017	Pb	1A2e	FOREST RESIDUE CHIPS	0,045000000	kg/TJ
2017	Pb	1A2e	HEAVY FUEL OIL (S<1%)	0,025280177	kg/TJ
2017	Pb	1A2e	MILLED PEAT	0,113994855	kg/TJ
2017	Pb	1A2e	PEAT PELLETS AND BRIQUETTES	0,001000000	kg/TJ
2017	Pb	1A2e	SAWDUST AND CUTTER CHIPS	0,045000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Pb	1A2e	FUELS)	0,045000000	kg/TJ
2017	Pb	1A2e	WOOD RESIDUE CHIPS	0,045000000	kg/TJ
2017	Pb	1A2f	CHIPS FROM ROUNDWOOD	0,045000000	kg/TJ
2017	Pb	1A2f	COAL (S=1.0%)	0,518142005	kg/TJ
2017	Pb	1A2f	COKE (S=1.0%)	0,790000000	kg/TJ
2017	Pb	1A2f	FOREST RESIDUE CHIPS	0,045000000	kg/TJ
2017	Pb	1A2f	HEAVY FUEL OIL (S<1%)	0,017838416	kg/TJ
2017	Pb	1A2f	PETROLEUM COKE	0,295810441	kg/TJ
2017	Pb	1A2f	RECOVERED FUEL (REF 2)	0,033089594	kg/TJ
2017	Pb	1A2f	RECYCLED AND WASTE OILS	0,011253034	kg/TJ
2017	Pb	1A2f	RUBBER WASTE	0,010063724	kg/TJ
2017	Pb	1A2f	SAWDUST AND CUTTER CHIPS	0,005524714	kg/TJ
2017	Pb	1A2gviii	BARK	0,026567285	kg/TJ
2017	Pb	1A2gviii	CHIPS FROM ROUNDWOOD	0,030268368	kg/TJ
2017	Pb	1A2gviii	COAL (S=1.0%)	0,790000000	kg/TJ
2017	Pb	1A2gviii	FOREST RESIDUE CHIPS	0,010374209	kg/TJ
2017	Pb	1A2gviii	HAZARDOUS WASTE	0,000110648	kg/TJ
2017	Pb	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,025000000	kg/TJ
2017	Pb	1A2gviii	HEAVY FUEL OIL (S<1%)	0,022983549	kg/TJ
2017	Pb	1A2gviii	INDUSTRIAL WASTE	0,001046154	kg/TJ
2017	Pb	1A2gviii	MILLED PEAT	0,001178218	kg/TJ
2017	Pb	1A2gviii	MUNICIPAL WASTE - unsorted	0,000551917	kg/TJ
2017	Pb	1A2gviii	OTHER FOSSIL LIQUID	0,025000000	kg/TJ
2017	Pb	1A2gviii	OTHER NON-FOSSIL SOLID	0,003808661	kg/TJ
2017	Pb	1A2gviii	OTHER WOOD RESIDUE	0,013564840	kg/TJ
2017	Pb	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,005735416	kg/TJ
2017	Pb	1A2gviii	RECOVERED FUEL (REF 2)	0,001228501	kg/TJ
2017	Pb	1A2gviii	RECOVERED WOOD	0,001228501	kg/TJ
2017	Pb	1A2gviii	SAWDUST AND CUTTER CHIPS	0,026278944	kg/TJ
2017	Pb	1A2gviii	SOD PEAT	0,162579689	kg/TJ

2017	Pb	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD	0,018942443	kg/TJ
2017	Pb	1A2gviii	FUELS)	0,035469424	kg/TJ
2017	Pb	1A2gviii	WOOD RESIDUE CHIPS	0,021855400	kg/TJ
2017	Pb	1A3aii(i)	AVIATION GASOLINE	13,443935927	kg/TJ
2017	Pb	1A3bi	DIESEL OIL (S=001%)	0,000011682	kg/TJ
2017	Pb	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000037209	kg/TJ
2017	Pb	1A3bii	DIESEL OIL (S=001%)	0,000011682	kg/TJ
2017	Pb	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000037209	kg/TJ
2017	Pb	1A3biii	DIESEL OIL (S=001%)	0,000011682	kg/TJ
2017	Pb	1A3biv	DIESEL OIL (S=001%)	0,000011682	kg/TJ
2017	Pb	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000037209	kg/TJ
2017	Pb	1A3dii	GASOIL (FOR NON-ROAD USE)	0,003021400	kg/TJ
2017	Pb	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,004440815	kg/TJ
2017	Pb	1A4ai	FOREST WOODFUEL	0,010000000	kg/TJ
2017	Pb	1A4ai	HEAVY FUEL OIL (S<1%)	0,024935044	kg/TJ
2017	Pb	1A4ai	SOD PEAT	0,170000000	kg/TJ
2017	Pb	1A4bi	COAL (S=1.0%)	0,395000000	kg/TJ
2017	Pb	1A4bi	FOREST WOODFUEL	0,010000000	kg/TJ
2017	Pb	1A4bi	HEAVY FUEL OIL (S<1%)	0,025000000	kg/TJ
2017	Pb	1A4bi	SOD PEAT	0,170000000	kg/TJ
2017	Pb	1A4ci	COAL (S=1.0%)	0,003900000	kg/TJ
2017	Pb	1A4ci	FOREST WOODFUEL	0,010000000	kg/TJ
2017	Pb	1A4ci	HEAVY FUEL OIL (S<1%)	0,025000000	kg/TJ
2017	Pb	1A4ci	SOD PEAT	0,170000000	kg/TJ
2017	Pb	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,003009259	kg/TJ
2017	Pb	1A5a	FOREST WOODFUEL	0,045000000	kg/TJ
2017	Pb	1A5a	HEAVY FUEL OIL (S<1%)	0,025000000	kg/TJ
2017	Pb	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000260520	kg/TJ
2017	Pb	1A5a	OTHER PETROLEUM PRODUCTS	0,025000000	kg/TJ

## Cd Implied emission factors in Finnish air pollutant inventory for 2017

2017	Cd	1A1a	ANIMAL-BASED FUELS	0,000061973	kg/TJ
2017	Cd	1A1a	BARK	0,001004316	kg/TJ
2017	Cd	1A1a	CHIPS FROM ROUNDWOOD	0,001285110	kg/TJ
2017	Cd	1A1a	COAL (S=1.0%)	0,000339546	kg/TJ
2017	Cd	1A1a	DEINKING WASTE	0,003934489	kg/TJ
2017	Cd	1A1a	DEMOLITION WOOD	0,000475189	kg/TJ
2017	Cd	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,005000000	kg/TJ
2017	Cd	1A1a	FOREST RESIDUE CHIPS	0,001182057	kg/TJ
2017	Cd	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000054988	kg/TJ
2017	Cd	1A1a	HEAVY FUEL OIL (S<1%)	0,000246914	kg/TJ
2017	Cd	1A1a	INDUSTRIAL WASTE	0,000228918	kg/TJ
2017	Cd	1A1a	MILLED PEAT	0,000163590	kg/TJ
2017	Cd	1A1a	MUNICIPAL WASTE - unsorted	0,001331426	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Cd	1A1a	INDUSTRY	0,000318548	kg/TJ
2017	Cd	1A1a	OTHER FOSSIL LIQUID	0,000180285	kg/TJ
2017	Cd	1A1a	OTHER FOSSIL SOLID	0,000199587	kg/TJ
2017	Cd	1A1a	OTHER NON-FOSSIL SOLID	0,001533447	kg/TJ
2017	Cd	1A1a	OTHER WASTE	0,000031204	kg/TJ
2017	Cd	1A1a	OTHER WOOD RESIDUE	0,001332863	kg/TJ
2017	Cd	1A1a	PEAT PELLETS AND BRIQUETTES	0,000132117	kg/TJ
2017	Cd	1A1a	RECOVERED FUEL (REF 2)	0,000293198	kg/TJ
2017	Cd	1A1a	RECOVERED FUEL (REF 3)	0,000221763	kg/TJ
2017	Cd	1A1a	RECOVERED WOOD	0,000388600	kg/TJ
2017	Cd	1A1a	RECYCLED AND WASTE OILS	0,000105247	kg/TJ
2017	Cd	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000225000	kg/TJ
2017	Cd	1A1a	SALT TREATED WOOD	0,000481535	kg/TJ
2017	Cd	1A1a	SAWDUST AND CUTTER CHIPS	0,001063743	kg/TJ
2017	Cd	1A1a	SOD PEAT	0,002651381	kg/TJ
2017	Cd	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,001464507	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cd	1A1a	FUELS)	0,000928676	kg/TJ
2017	Cd	1A1a	WOOD RESIDUE CHIPS	0,002091196	kg/TJ
2017	Cd	1A1b	HEAVY FUEL OIL (S<1%)	0,000200662	kg/TJ
2017	Cd	1A1b	PETROLEUM COKE	0,018000000	kg/TJ
2017	Cd	1A2a	HEAVY FUEL OIL (S<1%)	0,000511942	kg/TJ
2017	Cd	1A2a	MILLED PEAT	0,002800000	kg/TJ
2017	Cd	1A2a	OTHER FOSSIL LIQUID	0,000300000	kg/TJ
2017	Cd	1A2a	WOOD RESIDUE CHIPS	0,005000000	kg/TJ
2017	Cd	1A2b	HEAVY FUEL OIL (S<1%)	0,000024684	kg/TJ
2017	Cd	1A2c	COAL (S=1.0%)	0,000118275	kg/TJ
2017	Cd	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,000300000	kg/TJ
2017	Cd	1A2c	HEAVY FUEL OIL (S<1%)	0,000299375	kg/TJ
2017	Cd	1A2c	OTHER FOSSIL LIQUID	0,000300000	kg/TJ
2017	Cd	1A2c	PETROLEUM COKE	0,018000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cd	1A2c	FUELS)	0,003188622	kg/TJ
2017	Cd	1A2d	ANIMAL-BASED FUELS	0,000164204	kg/TJ
2017	Cd	1A2d	BARK	0,000441169	kg/TJ
2017	Cd	1A2d	BLACK LIQUOR	0,001889406	kg/TJ
2017	Cd	1A2d	CHIPS FROM ROUNDWOOD	0,000441569	kg/TJ
2017	Cd	1A2d	COAL (S=1.0%)	0,000028618	kg/TJ
2017	Cd	1A2d	DEMOLITION WOOD	0,000109003	kg/TJ
2017	Cd	1A2d	FOREST RESIDUE CHIPS	0,000267766	kg/TJ
2017	Cd	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,000180410	kg/TJ



2017	Cd	1A2d	HEAVY FUEL OIL (S<1%)	0,000138060	kg/TJ
2017	Cd	1A2d	INDUSTRIAL WASTE	0,005000000	kg/TJ
2017	Cd	1A2d	MILLED PEAT	0,000009789	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Cd	1A2d	INDUSTRY	0,000574943	kg/TJ
2017	Cd	1A2d	OTHER NON-FOSSIL SOLID	0,000100667	kg/TJ
2017	Cd	1A2d	OTHER WASTE	0,000255220	kg/TJ
2017	Cd	1A2d	OTHER WOOD RESIDUE	0,004729682	kg/TJ
2017	Cd	1A2d	PLASTIC WASTE	0,000287399	kg/TJ
2017	Cd	1A2d	RECOVERED FUEL (REF 2)	0,000634805	kg/TJ
2017	Cd	1A2d	RECOVERED WOOD	0,000264434	kg/TJ
2017	Cd	1A2d	RECYCLED AND WASTE OILS	0,000043601	kg/TJ
2017	Cd	1A2d	SALT TREATED WOOD	0,000109003	kg/TJ
2017	Cd	1A2d	SAWDUST AND CUTTER CHIPS	0,001472155	kg/TJ
2017	Cd	1A2d	SOD PEAT	0,000059093	kg/TJ
2017	Cd	1A2d	SULPHUR CONCENTRATE	0,000037275	kg/TJ
2017	Cd	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000880975	kg/TJ
2017	Cd	1A2d	WOOD RESIDUE CHIPS	0,000322814	kg/TJ
2017	Cd	1A2e	ANIMAL-BASED FUELS	0,005000000	kg/TJ
2017	Cd	1A2e	COAL (S=1.0%)	0,000197521	kg/TJ
2017	Cd	1A2e	COKE (S=1.0%)	0,018000000	kg/TJ
2017	Cd	1A2e	FOREST RESIDUE CHIPS	0,005000000	kg/TJ
2017	Cd	1A2e	HEAVY FUEL OIL (S<1%)	0,000316792	kg/TJ
2017	Cd	1A2e	MILLED PEAT	0,001878732	kg/TJ
2017	Cd	1A2e	PEAT PELLETS AND BRIQUETTES	0,000020000	kg/TJ
2017	Cd	1A2e	SAWDUST AND CUTTER CHIPS	0,005000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cd	1A2e	FUELS)	0,005000000	kg/TJ
2017	Cd	1A2e	WOOD RESIDUE CHIPS	0,005000000	kg/TJ
2017	Cd	1A2f	CHIPS FROM ROUNDWOOD	0,005000000	kg/TJ
2017	Cd	1A2f	COAL (S=1.0%)	0,011826739	kg/TJ
2017	Cd	1A2f	COKE (S=1.0%)	0,018000000	kg/TJ
2017	Cd	1A2f	FOREST RESIDUE CHIPS	0,005000000	kg/TJ
2017	Cd	1A2f	HEAVY FUEL OIL (S<1%)	0,000270489	kg/TJ
2017	Cd	1A2f	PETROLEUM COKE	0,006730203	kg/TJ
2017	Cd	1A2f	RECOVERED FUEL (REF 2)	0,003506449	kg/TJ
2017	Cd	1A2f	RECYCLED AND WASTE OILS	0,000269830	kg/TJ
2017	Cd	1A2f	RUBBER WASTE	0,000619032	kg/TJ
2017	Cd	1A2f	SAWDUST AND CUTTER CHIPS	0,001126297	kg/TJ
2017	Cd	1A2gvii	DIESEL OIL (S=001%)	0,000231481	kg/TJ
2017	Cd	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,000237895	kg/TJ
2017	Cd	1A2gviii	BARK	0,003063494	kg/TJ
2017	Cd	1A2gviii	CHIPS FROM ROUNDWOOD	0,003525449	kg/TJ
2017	Cd	1A2gviii	COAL (S=1.0%)	0,018000000	kg/TJ
2017	Cd	1A2gviii	FOREST RESIDUE CHIPS	0,001401697	kg/TJ
2017	Cd	1A2gviii	HAZARDOUS WASTE	0,000129957	kg/TJ
2017	Cd	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,000300000	kg/TJ
2017	Cd	1A2gviii	HEAVY FUEL OIL (S<1%)	0,000285144	kg/TJ
2017	Cd	1A2gviii	INDUSTRIAL WASTE	0,000225000	kg/TJ
2017	Cd	1A2gviii	MILLED PEAT	0,000022927	kg/TJ
2017	Cd	1A2gviii	MUNICIPAL WASTE - unsorted	0,000098862	kg/TJ
2017	Cd	1A2gviii	OTHER FOSSIL LIQUID	0,000300000	kg/TJ
2017	Cd	1A2gviii	OTHER NON-FOSSIL SOLID	0,000564197	kg/TJ
2017	Cd	1A2gviii	OTHER WOOD RESIDUE	0,001599562	kg/TJ
2017	Cd	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,000301864	kg/TJ
2017	Cd	1A2gviii	RECOVERED FUEL (REF 2)	0,000081900	kg/TJ
2017	Cd	1A2gviii	RECOVERED WOOD	0,000081900	kg/TJ

2017	Cd	1A2gviii	SAWDUST AND CUTTER CHIPS	0,003096231	kg/TJ
2017	Cd	1A2gviii	SOD PEAT	0,002676839	kg/TJ
2017	Cd	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,002227769	kg/TJ
2017	Cd	1A2gviii	WOOD RESIDUE CHIPS	0,003969048	kg/TJ
2017	Cd	1A2gviii	WOOD RESIDUE CHIPS	0,002493988	kg/TJ
2017	Cd	1A3bi	DIESEL OIL (S=001%)	0,000001168	kg/TJ
2017	Cd	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000004651	kg/TJ
2017	Cd	1A3bii	DIESEL OIL (S=001%)	0,000001168	kg/TJ
2017	Cd	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000004651	kg/TJ
2017	Cd	1A3biii	DIESEL OIL (S=001%)	0,000001168	kg/TJ
2017	Cd	1A3biv	DIESEL OIL (S=001%)	0,000001168	kg/TJ
2017	Cd	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000004651	kg/TJ
2017	Cd	1A3c	GASOIL (FOR NON-ROAD USE)	0,000231481	kg/TJ
2017	Cd	1A3dii	GASOIL (FOR NON-ROAD USE)	0,000232415	kg/TJ
2017	Cd	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,000493424	kg/TJ
2017	Cd	1A4ai	FOREST WOODFUEL	0,003000000	kg/TJ
2017	Cd	1A4ai	HEAVY FUEL OIL (S<1%)	0,000300000	kg/TJ
2017	Cd	1A4ai	SOD PEAT	0,002800000	kg/TJ
2017	Cd	1A4aii	DIESEL OIL (S=001%)	0,000231481	kg/TJ
2017	Cd	1A4aii	LIQUID GAS	0,000217391	kg/TJ
2017	Cd	1A4aii	MOTOR GASOLINE (S=0.001%)	0,000237895	kg/TJ
2017	Cd	1A4bi	COAL (S=1.0%)	0,009000000	kg/TJ
2017	Cd	1A4bi	FOREST WOODFUEL	0,003000000	kg/TJ
2017	Cd	1A4bi	HEAVY FUEL OIL (S<1%)	0,000300000	kg/TJ
2017	Cd	1A4bi	SOD PEAT	0,002800000	kg/TJ
2017	Cd	1A4bii	DIESEL OIL (S=001%)	0,000231481	kg/TJ
2017	Cd	1A4bii	MOTOR GASOLINE (S=0.001%)	0,000237895	kg/TJ
2017	Cd	1A4ci	COAL (S=1.0%)	0,000200000	kg/TJ
2017	Cd	1A4ci	FOREST WOODFUEL	0,003000000	kg/TJ
2017	Cd	1A4ci	HEAVY FUEL OIL (S<1%)	0,000300000	kg/TJ
2017	Cd	1A4ci	SOD PEAT	0,002800000	kg/TJ
2017	Cd	1A4cii	DIESEL OIL (S=001%)	0,000231481	kg/TJ
2017	Cd	1A4cii	MOTOR GASOLINE (S=0.001%)	0,000237895	kg/TJ
2017	Cd	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,000231481	kg/TJ
2017	Cd	1A5a	FOREST WOODFUEL	0,005000000	kg/TJ
2017	Cd	1A5a	HEAVY FUEL OIL (S<1%)	0,000300000	kg/TJ
2017	Cd	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000022695	kg/TJ
2017	Cd	1A5a	OTHER PETROLEUM PRODUCTS	0,000300000	kg/TJ

## Hg Implied emission factors in Finnish air pollutant inventory for 2017

2017	Hg	1A1a	ANIMAL-BASED FUELS	0,000701572	kg/TJ
2017	Hg	1A1a	BARK	0,000480442	kg/TJ
2017	Hg	1A1a	CHIPS FROM ROUNDWOOD	0,000427436	kg/TJ
2017	Hg	1A1a	COAL (S=1.0%)	0,000602636	kg/TJ
2017	Hg	1A1a	DEINKING WASTE	0,000467495	kg/TJ
2017	Hg	1A1a	DEMOLITION WOOD	0,000476670	kg/TJ
2017	Hg	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,000500000	kg/TJ
2017	Hg	1A1a	FOREST RESIDUE CHIPS	0,000452271	kg/TJ
2017	Hg	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000000862	kg/TJ
2017	Hg	1A1a	HEAVY FUEL OIL (S<1%)	0,000028180	kg/TJ
2017	Hg	1A1a	INDUSTRIAL WASTE	0,000343753	kg/TJ
2017	Hg	1A1a	MILLED PEAT	0,001416620	kg/TJ
2017	Hg	1A1a	MUNICIPAL WASTE - unsorted	0,000186733	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Hg	1A1a	INDUSTRY	0,000391710	kg/TJ
2017	Hg	1A1a	OTHER FOSSIL LIQUID	0,000028870	kg/TJ
2017	Hg	1A1a	OTHER FOSSIL SOLID	0,001399764	kg/TJ
2017	Hg	1A1a	OTHER NON-FOSSIL SOLID	0,000461758	kg/TJ
2017	Hg	1A1a	OTHER WASTE	0,000199527	kg/TJ
2017	Hg	1A1a	OTHER WOOD RESIDUE	0,000481245	kg/TJ
2017	Hg	1A1a	PEAT PELLETS AND BRIQUETTES	0,001686419	kg/TJ
2017	Hg	1A1a	RECOVERED FUEL (REF 2)	0,000233596	kg/TJ
2017	Hg	1A1a	RECOVERED FUEL (REF 3)	0,000342724	kg/TJ
2017	Hg	1A1a	RECOVERED WOOD	0,000244752	kg/TJ
2017	Hg	1A1a	RECYCLED AND WASTE OILS	0,000020890	kg/TJ
2017	Hg	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000339286	kg/TJ
2017	Hg	1A1a	SALT TREATED WOOD	0,000488165	kg/TJ
2017	Hg	1A1a	SAWDUST AND CUTTER CHIPS	0,000485403	kg/TJ
2017	Hg	1A1a	SOD PEAT	0,002540297	kg/TJ
2017	Hg	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000532519	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Hg	1A1a	FUELS)	0,000455277	kg/TJ
2017	Hg	1A1a	WOOD RESIDUE CHIPS	0,000460063	kg/TJ
2017	Hg	1A1b	HEAVY FUEL OIL (S<1%)	0,000030000	kg/TJ
2017	Hg	1A1b	PETROLEUM COKE	0,003700000	kg/TJ
2017	Hg	1A2a	COKE (S=1.0%)	0,000099412	kg/TJ
2017	Hg	1A2a	HEAVY FUEL OIL (S<1%)	0,000031439	kg/TJ
2017	Hg	1A2a	MILLED PEAT	0,002600000	kg/TJ
2017	Hg	1A2a	OTHER FOSSIL LIQUID	0,000030000	kg/TJ
2017	Hg	1A2a	OTHER FOSSIL SOLID	0,001400000	kg/TJ
2017	Hg	1A2a	WOOD RESIDUE CHIPS	0,000500000	kg/TJ
2017	Hg	1A2b	HEAVY FUEL OIL (S<1%)	0,000007946	kg/TJ
2017	Hg	1A2c	COAL (S=1.0%)	0,001054025	kg/TJ
2017	Hg	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,000030000	kg/TJ
2017	Hg	1A2c	HEAVY FUEL OIL (S<1%)	0,000030000	kg/TJ
2017	Hg	1A2c	OTHER FOSSIL LIQUID	0,000030000	kg/TJ
2017	Hg	1A2c	PETROLEUM COKE	0,003700000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Hg	1A2c	FUELS)	0,000452423	kg/TJ
2017	Hg	1A2d	ANIMAL-BASED FUELS	0,000291131	kg/TJ
2017	Hg	1A2d	BARK	0,000583741	kg/TJ
2017	Hg	1A2d	BLACK LIQUOR	0,000608224	kg/TJ
2017	Hg	1A2d	CHIPS FROM ROUNDWOOD	0,000482094	kg/TJ
2017	Hg	1A2d	COAL (S=1.0%)	0,000801198	kg/TJ
2017	Hg	1A2d	DEMOLITION WOOD	0,000256795	kg/TJ

2017	Hg	1A2d	FOREST RESIDUE CHIPS	0,000442791	kg/TJ
2017	Hg	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,000026764	kg/TJ
2017	Hg	1A2d	HEAVY FUEL OIL (S<1%)	0,000025501	kg/TJ
2017	Hg	1A2d	INDUSTRIAL WASTE	0,000500000	kg/TJ
2017	Hg	1A2d	MILLED PEAT	0,001359515	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Hg	1A2d	INDUSTRY	0,000476799	kg/TJ
2017	Hg	1A2d	OTHER NON-FOSSIL SOLID	0,000343966	kg/TJ
2017	Hg	1A2d	OTHER WASTE	0,000347744	kg/TJ
2017	Hg	1A2d	OTHER WOOD RESIDUE	0,000491246	kg/TJ
2017	Hg	1A2d	PLASTIC WASTE	0,000645016	kg/TJ
2017	Hg	1A2d	RECOVERED FUEL (REF 2)	0,001154750	kg/TJ
2017	Hg	1A2d	RECOVERED WOOD	0,000584850	kg/TJ
2017	Hg	1A2d	RECYCLED AND WASTE OILS	0,000015408	kg/TJ
2017	Hg	1A2d	SALT TREATED WOOD	0,000256795	kg/TJ
2017	Hg	1A2d	SAWDUST AND CUTTER CHIPS	0,000451018	kg/TJ
2017	Hg	1A2d	SOD PEAT	0,002273039	kg/TJ
2017	Hg	1A2d	SULPHUR CONCENTRATE	0,000339286	kg/TJ
2017	Hg	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000599768	kg/TJ
2017	Hg	1A2d	WOOD RESIDUE CHIPS	0,000427516	kg/TJ
2017	Hg	1A2e	ANIMAL-BASED FUELS	0,000500000	kg/TJ
2017	Hg	1A2e	COAL (S=1.0%)	0,001400990	kg/TJ
2017	Hg	1A2e	COKE (S=1.0%)	0,003700000	kg/TJ
2017	Hg	1A2e	FOREST RESIDUE CHIPS	0,000500000	kg/TJ
2017	Hg	1A2e	HEAVY FUEL OIL (S<1%)	0,000028757	kg/TJ
2017	Hg	1A2e	MILLED PEAT	0,002169191	kg/TJ
2017	Hg	1A2e	PEAT PELLETS AND BRIQUETTES	0,001300000	kg/TJ
2017	Hg	1A2e	SAWDUST AND CUTTER CHIPS	0,000500000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Hg	1A2e	FUELS)	0,000500000	kg/TJ
2017	Hg	1A2e	WOOD RESIDUE CHIPS	0,000500000	kg/TJ
2017	Hg	1A2f	CHIPS FROM ROUNDWOOD	0,000500000	kg/TJ
2017	Hg	1A2f	COAL (S=1.0%)	0,004925109	kg/TJ
2017	Hg	1A2f	COKE (S=1.0%)	0,003700000	kg/TJ
2017	Hg	1A2f	FOREST RESIDUE CHIPS	0,000500000	kg/TJ
2017	Hg	1A2f	HEAVY FUEL OIL (S<1%)	0,000090974	kg/TJ
2017	Hg	1A2f	PETROLEUM COKE	0,007493134	kg/TJ
2017	Hg	1A2f	RECOVERED FUEL (REF 2)	0,001507536	kg/TJ
2017	Hg	1A2f	RECYCLED AND WASTE OILS	0,000043255	kg/TJ
2017	Hg	1A2f	RUBBER WASTE	0,003455362	kg/TJ
2017	Hg	1A2f	SAWDUST AND CUTTER CHIPS	0,000512438	kg/TJ
2017	Hg	1A2gviii	BARK	0,000477505	kg/TJ
2017	Hg	1A2gviii	CHIPS FROM ROUNDWOOD	0,000500000	kg/TJ
2017	Hg	1A2gviii	COAL (S=1.0%)	0,003700000	kg/TJ
2017	Hg	1A2gviii	FOREST RESIDUE CHIPS	0,000408742	kg/TJ
2017	Hg	1A2gviii	HAZARDOUS WASTE	0,005161160	kg/TJ
2017	Hg	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,000030000	kg/TJ
2017	Hg	1A2gviii	HEAVY FUEL OIL (S<1%)	0,000032803	kg/TJ
2017	Hg	1A2gviii	INDUSTRIAL WASTE	0,000339286	kg/TJ
2017	Hg	1A2gviii	MILLED PEAT	0,001510925	kg/TJ
2017	Hg	1A2gviii	MUNICIPAL WASTE - unsorted	0,001239471	kg/TJ
2017	Hg	1A2gviii	OTHER FOSSIL LIQUID	0,000030000	kg/TJ
2017	Hg	1A2gviii	OTHER NON-FOSSIL SOLID	0,000500808	kg/TJ
2017	Hg	1A2gviii	OTHER WOOD RESIDUE	0,000500000	kg/TJ
2017	Hg	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,001056524	kg/TJ
2017	Hg	1A2gviii	RECOVERED FUEL (REF 2)	0,000409500	kg/TJ
2017	Hg	1A2gviii	RECOVERED WOOD	0,000409500	kg/TJ

2017	Hg	1A2gviii	SAWDUST AND CUTTER CHIPS	0,000529197	kg/TJ
2017	Hg	1A2gviii	SOD PEAT	0,002621780	kg/TJ
2017	Hg	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,000451615	kg/TJ
2017	Hg	1A2gviii	WOOD RESIDUE CHIPS	0,000527687	kg/TJ
2017	Hg	1A2gviii	WOOD RESIDUE CHIPS	0,000679174	kg/TJ
2017	Hg	1A3bi	DIESEL OIL (S=001%)	0,000123832	kg/TJ
2017	Hg	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000202326	kg/TJ
2017	Hg	1A3bii	DIESEL OIL (S=001%)	0,000123832	kg/TJ
2017	Hg	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000202326	kg/TJ
2017	Hg	1A3biii	DIESEL OIL (S=001%)	0,000123832	kg/TJ
2017	Hg	1A3biv	DIESEL OIL (S=001%)	0,000123832	kg/TJ
2017	Hg	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000202326	kg/TJ
2017	Hg	1A3dii	GASOIL (FOR NON-ROAD USE)	0,000697246	kg/TJ
2017	Hg	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,000493424	kg/TJ
2017	Hg	1A4ai	FOREST WOODFUEL	0,000500000	kg/TJ
2017	Hg	1A4ai	HEAVY FUEL OIL (S<1%)	0,000030000	kg/TJ
2017	Hg	1A4ai	SOD PEAT	0,002600000	kg/TJ
2017	Hg	1A4bi	COAL (S=1.0%)	0,001850000	kg/TJ
2017	Hg	1A4bi	FOREST WOODFUEL	0,000500000	kg/TJ
2017	Hg	1A4bi	HEAVY FUEL OIL (S<1%)	0,000030000	kg/TJ
2017	Hg	1A4bi	SOD PEAT	0,002600000	kg/TJ
2017	Hg	1A4ci	COAL (S=1.0%)	0,001400000	kg/TJ
2017	Hg	1A4ci	FOREST WOODFUEL	0,000500000	kg/TJ
2017	Hg	1A4ci	HEAVY FUEL OIL (S<1%)	0,000030000	kg/TJ
2017	Hg	1A4ci	SOD PEAT	0,002600000	kg/TJ
2017	Hg	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,000694444	kg/TJ
2017	Hg	1A5a	FOREST WOODFUEL	0,000500000	kg/TJ
2017	Hg	1A5a	HEAVY FUEL OIL (S<1%)	0,000030000	kg/TJ
2017	Hg	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000060120	kg/TJ
2017	Hg	1A5a	OTHER PETROLEUM PRODUCTS	0,000030000	kg/TJ

## As Implied emission factors in Finnish air pollutant inventory for 2017

2017	As	1A1a	ANIMAL-BASED FUELS	0,000171316	kg/TJ
2017	As	1A1a	BARK	0,000218506	kg/TJ
2017	As	1A1a	CHIPS FROM ROUNDWOOD	0,000566436	kg/TJ
2017	As	1A1a	COAL (S=1.0%)	0,001608305	kg/TJ
2017	As	1A1a	DEINKING WASTE	0,000785726	kg/TJ
2017	As	1A1a	DEMOLITION WOOD	0,000485212	kg/TJ
2017	As	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,001000000	kg/TJ
2017	As	1A1a	FOREST RESIDUE CHIPS	0,000313792	kg/TJ
2017	As	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000566853	kg/TJ
2017	As	1A1a	HEAVY FUEL OIL (S<1%)	0,001493870	kg/TJ
2017	As	1A1a	INDUSTRIAL WASTE	0,000011856	kg/TJ
2017	As	1A1a	MILLED PEAT	0,006267096	kg/TJ
2017	As	1A1a	MUNICIPAL WASTE - unsorted	0,000273051	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	As	1A1a	INDUSTRY	0,000136090	kg/TJ
2017	As	1A1a	OTHER FOSSIL LIQUID	0,000950415	kg/TJ
2017	As	1A1a	OTHER FOSSIL SOLID	0,007785969	kg/TJ
2017	As	1A1a	OTHER NON-FOSSIL SOLID	0,000299052	kg/TJ
2017	As	1A1a	OTHER WASTE	0,000265753	kg/TJ
2017	As	1A1a	OTHER WOOD RESIDUE	0,000262817	kg/TJ
2017	As	1A1a	PEAT PELLETS AND BRIQUETTES	0,000865585	kg/TJ
2017	As	1A1a	RECOVERED FUEL (REF 2)	0,000252600	kg/TJ
2017	As	1A1a	RECOVERED FUEL (REF 3)	0,000010080	kg/TJ
2017	As	1A1a	RECOVERED WOOD	0,000176110	kg/TJ
2017	As	1A1a	RECYCLED AND WASTE OILS	0,001837551	kg/TJ
2017	As	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000012821	kg/TJ
2017	As	1A1a	SALT TREATED WOOD	0,000106529	kg/TJ
2017	As	1A1a	SAWDUST AND CUTTER CHIPS	0,000247125	kg/TJ
2017	As	1A1a	SOD PEAT	0,076720175	kg/TJ
2017	As	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000274635	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	As	1A1a	FUELS)	0,000177301	kg/TJ
2017	As	1A1a	WOOD RESIDUE CHIPS	0,000501223	kg/TJ
2017	As	1A1b	HEAVY FUEL OIL (S<1%)	0,001006620	kg/TJ
2017	As	1A1b	PETROLEUM COKE	0,130000000	kg/TJ
2017	As	1A2a	HEAVY FUEL OIL (S<1%)	0,001545072	kg/TJ
2017	As	1A2a	MILLED PEAT	0,081000000	kg/TJ
2017	As	1A2a	OTHER FOSSIL LIQUID	0,002000000	kg/TJ
2017	As	1A2a	WOOD RESIDUE CHIPS	0,001000000	kg/TJ
2017	As	1A2b	HEAVY FUEL OIL (S<1%)	0,000164561	kg/TJ
2017	As	1A2c	COAL (S=1.0%)	0,001140791	kg/TJ
2017	As	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,002000000	kg/TJ
2017	As	1A2c	HEAVY FUEL OIL (S<1%)	0,001994797	kg/TJ
2017	As	1A2c	OTHER FOSSIL LIQUID	0,002000000	kg/TJ
2017	As	1A2c	PETROLEUM COKE	0,130000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	As	1A2c	FUELS)	0,000620585	kg/TJ
2017	As	1A2d	ANIMAL-BASED FUELS	0,000095876	kg/TJ
2017	As	1A2d	BARK	0,000078762	kg/TJ
2017	As	1A2d	BLACK LIQUOR	0,000998750	kg/TJ
2017	As	1A2d	CHIPS FROM ROUNDWOOD	0,000107535	kg/TJ
2017	As	1A2d	COAL (S=1.0%)	0,002426245	kg/TJ
2017	As	1A2d	DEMOLITION WOOD	0,000095198	kg/TJ
2017	As	1A2d	FOREST RESIDUE CHIPS	0,000075228	kg/TJ
2017	As	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,000371497	kg/TJ

2017	As	1A2d	HEAVY FUEL OIL (S<1%)	0,001027348	kg/TJ
2017	As	1A2d	INDUSTRIAL WASTE	0,001000000	kg/TJ
2017	As	1A2d	MILLED PEAT	0,000353783	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	As	1A2d	INDUSTRY	0,000110864	kg/TJ
2017	As	1A2d	OTHER NON-FOSSIL SOLID	0,000008827	kg/TJ
2017	As	1A2d	OTHER WASTE	0,000096994	kg/TJ
2017	As	1A2d	OTHER WOOD RESIDUE	0,000946765	kg/TJ
2017	As	1A2d	PLASTIC WASTE	0,000051549	kg/TJ
2017	As	1A2d	RECOVERED FUEL (REF 2)	0,000045358	kg/TJ
2017	As	1A2d	RECOVERED WOOD	0,000072658	kg/TJ
2017	As	1A2d	RECYCLED AND WASTE OILS	0,000951984	kg/TJ
2017	As	1A2d	SALT TREATED WOOD	0,000095198	kg/TJ
2017	As	1A2d	SAWDUST AND CUTTER CHIPS	0,000309037	kg/TJ
2017	As	1A2d	SOD PEAT	0,001826392	kg/TJ
2017	As	1A2d	SULPHUR CONCENTRATE	0,000022669	kg/TJ
2017	As	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000184637	kg/TJ
2017	As	1A2d	WOOD RESIDUE CHIPS	0,000077995	kg/TJ
2017	As	1A2e	ANIMAL-BASED FUELS	0,001000000	kg/TJ
2017	As	1A2e	COAL (S=1.0%)	0,007802090	kg/TJ
2017	As	1A2e	COKE (S=1.0%)	0,130000000	kg/TJ
2017	As	1A2e	FOREST RESIDUE CHIPS	0,001000000	kg/TJ
2017	As	1A2e	HEAVY FUEL OIL (S<1%)	0,002016972	kg/TJ
2017	As	1A2e	MILLED PEAT	0,054322993	kg/TJ
2017	As	1A2e	PEAT PELLETS AND BRIQUETTES	0,000500000	kg/TJ
2017	As	1A2e	SAWDUST AND CUTTER CHIPS	0,001000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	As	1A2e	FUELS)	0,001000000	kg/TJ
2017	As	1A2e	WOOD RESIDUE CHIPS	0,001000000	kg/TJ
2017	As	1A2f	CHIPS FROM ROUNDWOOD	0,001000000	kg/TJ
2017	As	1A2f	COAL (S=1.0%)	0,085859343	kg/TJ
2017	As	1A2f	COKE (S=1.0%)	0,130000000	kg/TJ
2017	As	1A2f	FOREST RESIDUE CHIPS	0,001000000	kg/TJ
2017	As	1A2f	HEAVY FUEL OIL (S<1%)	0,001355175	kg/TJ
2017	As	1A2f	PETROLEUM COKE	0,049894350	kg/TJ
2017	As	1A2f	RECOVERED FUEL (REF 2)	0,000675761	kg/TJ
2017	As	1A2f	RECYCLED AND WASTE OILS	0,000936960	kg/TJ
2017	As	1A2f	RUBBER WASTE	0,000048925	kg/TJ
2017	As	1A2f	SAWDUST AND CUTTER CHIPS	0,000129749	kg/TJ
2017	As	1A2gviii	BARK	0,000597374	kg/TJ
2017	As	1A2gviii	CHIPS FROM ROUNDWOOD	0,000683624	kg/TJ
2017	As	1A2gviii	COAL (S=1.0%)	0,130000000	kg/TJ
2017	As	1A2gviii	FOREST RESIDUE CHIPS	0,000234185	kg/TJ
2017	As	1A2gviii	HAZARDOUS WASTE	0,000397960	kg/TJ
2017	As	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,002000000	kg/TJ
2017	As	1A2gviii	HEAVY FUEL OIL (S<1%)	0,001882718	kg/TJ
2017	As	1A2gviii	INDUSTRIAL WASTE	0,000012821	kg/TJ
2017	As	1A2gviii	MILLED PEAT	0,000585007	kg/TJ
2017	As	1A2gviii	MUNICIPAL WASTE - unsorted	0,000218052	kg/TJ
2017	As	1A2gviii	OTHER FOSSIL LIQUID	0,002000000	kg/TJ
2017	As	1A2gviii	OTHER NON-FOSSIL SOLID	0,000109330	kg/TJ
2017	As	1A2gviii	OTHER WOOD RESIDUE	0,000319912	kg/TJ
2017	As	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,001207456	kg/TJ
2017	As	1A2gviii	RECOVERED FUEL (REF 2)	0,000409500	kg/TJ
2017	As	1A2gviii	RECOVERED WOOD	0,000409500	kg/TJ
2017	As	1A2gviii	SAWDUST AND CUTTER CHIPS	0,000597947	kg/TJ
2017	As	1A2gviii	SOD PEAT	0,077521186	kg/TJ

2017	As	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD	0,000426628	kg/TJ
2017	As	1A2gviii	FUELS)	0,000793810	kg/TJ
2017	As	1A2gviii	WOOD RESIDUE CHIPS	0,000562891	kg/TJ
2017	As	1A3bi	DIESEL OIL (S=001%)	0,000002336	kg/TJ
2017	As	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000006977	kg/TJ
2017	As	1A3bii	DIESEL OIL (S=001%)	0,000002336	kg/TJ
2017	As	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000006977	kg/TJ
2017	As	1A3biii	DIESEL OIL (S=001%)	0,000002336	kg/TJ
2017	As	1A3biv	DIESEL OIL (S=001%)	0,000002336	kg/TJ
2017	As	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000006977	kg/TJ
2017	As	1A3dii	GASOIL (FOR NON-ROAD USE)	0,000929661	kg/TJ
2017	As	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,016776411	kg/TJ
2017	As	1A4ai	FOREST WOODFUEL	0,001000000	kg/TJ
2017	As	1A4ai	HEAVY FUEL OIL (S<1%)	0,002000000	kg/TJ
2017	As	1A4ai	SOD PEAT	0,081000000	kg/TJ
2017	As	1A4bi	COAL (S=1.0%)	0,065000000	kg/TJ
2017	As	1A4bi	FOREST WOODFUEL	0,001000000	kg/TJ
2017	As	1A4bi	HEAVY FUEL OIL (S<1%)	0,002000000	kg/TJ
2017	As	1A4bi	SOD PEAT	0,081000000	kg/TJ
2017	As	1A4ci	COAL (S=1.0%)	0,007800000	kg/TJ
2017	As	1A4ci	FOREST WOODFUEL	0,001000000	kg/TJ
2017	As	1A4ci	HEAVY FUEL OIL (S<1%)	0,002000000	kg/TJ
2017	As	1A4ci	SOD PEAT	0,081000000	kg/TJ
2017	As	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,000925926	kg/TJ
2017	As	1A5a	FOREST WOODFUEL	0,001000000	kg/TJ
2017	As	1A5a	HEAVY FUEL OIL (S<1%)	0,002000000	kg/TJ
2017	As	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000080160	kg/TJ
2017	As	1A5a	OTHER PETROLEUM PRODUCTS	0,002000000	kg/TJ



## Cr Implied emission factors in Finnish air pollutant inventory for 2017

2017	Cr	1A1a	ANIMAL-BASED FUELS	0,000635062	kg/TJ
2017	Cr	1A1a	BARK	0,005718237	kg/TJ
2017	Cr	1A1a	CHIPS FROM ROUNDWOOD	0,006466768	kg/TJ
2017	Cr	1A1a	COAL (S=1.0%)	0,002038032	kg/TJ
2017	Cr	1A1a	DEINKING WASTE	0,027374963	kg/TJ
2017	Cr	1A1a	DEMOLITION WOOD	0,001892115	kg/TJ
2017	Cr	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,035000000	kg/TJ
2017	Cr	1A1a	FOREST RESIDUE CHIPS	0,006672421	kg/TJ
2017	Cr	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000093921	kg/TJ
2017	Cr	1A1a	HEAVY FUEL OIL (S<1%)	0,000830264	kg/TJ
2017	Cr	1A1a	INDUSTRIAL WASTE	0,000642778	kg/TJ
2017	Cr	1A1a	MILLED PEAT	0,008185747	kg/TJ
2017	Cr	1A1a	MUNICIPAL WASTE - unsorted	0,008889814	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Cr	1A1a	INDUSTRY	0,001472755	kg/TJ
2017	Cr	1A1a	OTHER FOSSIL LIQUID	0,000500000	kg/TJ
2017	Cr	1A1a	OTHER FOSSIL SOLID	0,004996123	kg/TJ
2017	Cr	1A1a	OTHER NON-FOSSIL SOLID	0,009722773	kg/TJ
2017	Cr	1A1a	OTHER WASTE	0,000926707	kg/TJ
2017	Cr	1A1a	OTHER WOOD RESIDUE	0,008179624	kg/TJ
2017	Cr	1A1a	PEAT PELLETS AND BRIQUETTES	0,003144954	kg/TJ
2017	Cr	1A1a	RECOVERED FUEL (REF 2)	0,001090232	kg/TJ
2017	Cr	1A1a	RECOVERED FUEL (REF 3)	0,000594727	kg/TJ
2017	Cr	1A1a	RECOVERED WOOD	0,001558971	kg/TJ
2017	Cr	1A1a	RECYCLED AND WASTE OILS	0,000364416	kg/TJ
2017	Cr	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000600000	kg/TJ
2017	Cr	1A1a	SALT TREATED WOOD	0,001957726	kg/TJ
2017	Cr	1A1a	SAWDUST AND CUTTER CHIPS	0,006390934	kg/TJ
2017	Cr	1A1a	SOD PEAT	0,132581437	kg/TJ
2017	Cr	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,010760303	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cr	1A1a	FUELS)	0,005410174	kg/TJ
2017	Cr	1A1a	WOOD RESIDUE CHIPS	0,013836465	kg/TJ
2017	Cr	1A1b	HEAVY FUEL OIL (S<1%)	0,000503310	kg/TJ
2017	Cr	1A1b	PETROLEUM COKE	1,000000000	kg/TJ
2017	Cr	1A2a	HEAVY FUEL OIL (S<1%)	0,001956211	kg/TJ
2017	Cr	1A2a	MILLED PEAT	0,140000000	kg/TJ
2017	Cr	1A2a	OTHER FOSSIL LIQUID	0,001000000	kg/TJ
2017	Cr	1A2a	WOOD RESIDUE CHIPS	0,035000000	kg/TJ
2017	Cr	1A2b	COAL (S=1.0%)	1,000000000	kg/TJ
2017	Cr	1A2b	COKE (S=1.0%)	1,000000000	kg/TJ
2017	Cr	1A2b	HEAVY FUEL OIL (S<1%)	0,001000000	kg/TJ
2017	Cr	1A2b	OTHER FOSSIL SOLID	1,000000000	kg/TJ
2017	Cr	1A2b	RECYCLED AND WASTE OILS	0,001000000	kg/TJ
2017	Cr	1A2c	COAL (S=1.0%)	0,001708895	kg/TJ
2017	Cr	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,001000000	kg/TJ
2017	Cr	1A2c	HEAVY FUEL OIL (S<1%)	0,000996875	kg/TJ
2017	Cr	1A2c	OTHER FOSSIL LIQUID	0,001000000	kg/TJ
2017	Cr	1A2c	PETROLEUM COKE	1,000000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cr	1A2c	FUELS)	0,021786587	kg/TJ
2017	Cr	1A2d	ANIMAL-BASED FUELS	0,001506662	kg/TJ
2017	Cr	1A2d	BARK	0,001789840	kg/TJ
2017	Cr	1A2d	BLACK LIQUOR	0,000294744	kg/TJ
2017	Cr	1A2d	CHIPS FROM ROUNDWOOD	0,002237168	kg/TJ

2017	Cr	1A2d	COAL (S=1.0%)	0,001989768	kg/TJ
2017	Cr	1A2d	DEMOLITION WOOD	0,001425562	kg/TJ
2017	Cr	1A2d	FOREST RESIDUE CHIPS	0,001645557	kg/TJ
2017	Cr	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,000354427	kg/TJ
2017	Cr	1A2d	HEAVY FUEL OIL (S<1%)	0,000558388	kg/TJ
2017	Cr	1A2d	INDUSTRIAL WASTE	0,035000000	kg/TJ
2017	Cr	1A2d	MILLED PEAT	0,000678023	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Cr	1A2d	INDUSTRY	0,003000330	kg/TJ
2017	Cr	1A2d	OTHER NON-FOSSIL SOLID	0,000640768	kg/TJ
2017	Cr	1A2d	OTHER WASTE	0,001640380	kg/TJ
2017	Cr	1A2d	OTHER WOOD RESIDUE	0,033291006	kg/TJ
2017	Cr	1A2d	PLASTIC WASTE	0,000547908	kg/TJ
2017	Cr	1A2d	RECOVERED FUEL (REF 2)	0,000877111	kg/TJ
2017	Cr	1A2d	RECOVERED WOOD	0,001074906	kg/TJ
2017	Cr	1A2d	RECYCLED AND WASTE OILS	0,000356391	kg/TJ
2017	Cr	1A2d	SALT TREATED WOOD	0,001425562	kg/TJ
2017	Cr	1A2d	SAWDUST AND CUTTER CHIPS	0,009892727	kg/TJ
2017	Cr	1A2d	SOD PEAT	0,003208004	kg/TJ
2017	Cr	1A2d	SULPHUR CONCENTRATE	0,003624885	kg/TJ
2017	Cr	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,005417783	kg/TJ
2017	Cr	1A2d	WOOD RESIDUE CHIPS	0,001976270	kg/TJ
2017	Cr	1A2e	ANIMAL-BASED FUELS	0,035000000	kg/TJ
2017	Cr	1A2e	COAL (S=1.0%)	0,004994467	kg/TJ
2017	Cr	1A2e	COKE (S=1.0%)	1,000000000	kg/TJ
2017	Cr	1A2e	FOREST RESIDUE CHIPS	0,035000000	kg/TJ
2017	Cr	1A2e	HEAVY FUEL OIL (S<1%)	0,000994858	kg/TJ
2017	Cr	1A2e	MILLED PEAT	0,093870318	kg/TJ
2017	Cr	1A2e	PEAT PELLETS AND BRIQUETTES	0,000800000	kg/TJ
2017	Cr	1A2e	SAWDUST AND CUTTER CHIPS	0,035000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cr	1A2e	FUELS)	0,035000000	kg/TJ
2017	Cr	1A2e	WOOD RESIDUE CHIPS	0,035000000	kg/TJ
2017	Cr	1A2f	CHIPS FROM ROUNDWOOD	0,035000000	kg/TJ
2017	Cr	1A2f	COAL (S=1.0%)	0,654038905	kg/TJ
2017	Cr	1A2f	COKE (S=1.0%)	0,767390150	kg/TJ
2017	Cr	1A2f	FOREST RESIDUE CHIPS	0,035000000	kg/TJ
2017	Cr	1A2f	HEAVY FUEL OIL (S<1%)	0,000755358	kg/TJ
2017	Cr	1A2f	PETROLEUM COKE	0,368074086	kg/TJ
2017	Cr	1A2f	RECOVERED FUEL (REF 2)	0,023692280	kg/TJ
2017	Cr	1A2f	RECYCLED AND WASTE OILS	0,000778721	kg/TJ
2017	Cr	1A2f	RUBBER WASTE	0,001831556	kg/TJ
2017	Cr	1A2f	SAWDUST AND CUTTER CHIPS	0,006324273	kg/TJ
2017	Cr	1A2gvii	DIESEL OIL (S=001%)	0,001157407	kg/TJ
2017	Cr	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,001189476	kg/TJ
2017	Cr	1A2gviii	BARK	0,020465318	kg/TJ
2017	Cr	1A2gviii	CHIPS FROM ROUNDWOOD	0,024237790	kg/TJ
2017	Cr	1A2gviii	COAL (S=1.0%)	1,000000000	kg/TJ
2017	Cr	1A2gviii	FOREST RESIDUE CHIPS	0,007847332	kg/TJ
2017	Cr	1A2gviii	HAZARDOUS WASTE	0,001783032	kg/TJ
2017	Cr	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,001000000	kg/TJ
2017	Cr	1A2gviii	HEAVY FUEL OIL (S<1%)	0,000929875	kg/TJ
2017	Cr	1A2gviii	INDUSTRIAL WASTE	0,000600000	kg/TJ
2017	Cr	1A2gviii	MILLED PEAT	0,000946796	kg/TJ
2017	Cr	1A2gviii	MUNICIPAL WASTE - unsorted	0,001066547	kg/TJ
2017	Cr	1A2gviii	OTHER FOSSIL LIQUID	0,001000000	kg/TJ
2017	Cr	1A2gviii	OTHER NON-FOSSIL SOLID	0,002330420	kg/TJ

2017	Cr	1A2gviii	OTHER WOOD RESIDUE	0,010063455	kg/TJ
2017	Cr	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,003999698	kg/TJ
2017	Cr	1A2gviii	RECOVERED FUEL (REF 2)	0,000819001	kg/TJ
2017	Cr	1A2gviii	RECOVERED WOOD	0,000819001	kg/TJ
2017	Cr	1A2gviii	SAWDUST AND CUTTER CHIPS	0,020187051	kg/TJ
2017	Cr	1A2gviii	SOD PEAT	0,133889785	kg/TJ
2017	Cr	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,014486442	kg/TJ
2017	Cr	1A2gviii	WOOD RESIDUE CHIPS	0,027439687	kg/TJ
2017	Cr	1A2gviii	WOOD RESIDUE CHIPS	0,016644075	kg/TJ
2017	Cr	1A3bi	DIESEL OIL (S=001%)	0,000198598	kg/TJ
2017	Cr	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000146512	kg/TJ
2017	Cr	1A3bii	DIESEL OIL (S=001%)	0,000198598	kg/TJ
2017	Cr	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000146512	kg/TJ
2017	Cr	1A3biii	DIESEL OIL (S=001%)	0,000198598	kg/TJ
2017	Cr	1A3biv	DIESEL OIL (S=001%)	0,000198598	kg/TJ
2017	Cr	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000146512	kg/TJ
2017	Cr	1A3c	GASOIL (FOR NON-ROAD USE)	0,001157407	kg/TJ
2017	Cr	1A3dii	GASOIL (FOR NON-ROAD USE)	0,001162077	kg/TJ
2017	Cr	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,017763258	kg/TJ
2017	Cr	1A4ai	FOREST WOODFUEL	0,035000000	kg/TJ
2017	Cr	1A4ai	HEAVY FUEL OIL (S<1%)	0,001000000	kg/TJ
2017	Cr	1A4ai	SOD PEAT	0,140000000	kg/TJ
2017	Cr	1A4aii	DIESEL OIL (S=001%)	0,001157407	kg/TJ
2017	Cr	1A4aii	LIQUID GAS	0,001086957	kg/TJ
2017	Cr	1A4aii	MOTOR GASOLINE (S=0.001%)	0,001189476	kg/TJ
2017	Cr	1A4bi	COAL (S=1.0%)	0,500000000	kg/TJ
2017	Cr	1A4bi	FOREST WOODFUEL	0,035000000	kg/TJ
2017	Cr	1A4bi	HEAVY FUEL OIL (S<1%)	0,001000000	kg/TJ
2017	Cr	1A4bi	SOD PEAT	0,140000000	kg/TJ
2017	Cr	1A4bii	DIESEL OIL (S=001%)	0,001157407	kg/TJ
2017	Cr	1A4bii	MOTOR GASOLINE (S=0.001%)	0,001189476	kg/TJ
2017	Cr	1A4ci	COAL (S=1.0%)	0,005000000	kg/TJ
2017	Cr	1A4ci	FOREST WOODFUEL	0,035000000	kg/TJ
2017	Cr	1A4ci	HEAVY FUEL OIL (S<1%)	0,001000000	kg/TJ
2017	Cr	1A4ci	SOD PEAT	0,140000000	kg/TJ
2017	Cr	1A4cii	DIESEL OIL (S=001%)	0,001157407	kg/TJ
2017	Cr	1A4cii	MOTOR GASOLINE (S=0.001%)	0,001189476	kg/TJ
2017	Cr	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,001157407	kg/TJ
2017	Cr	1A5a	FOREST WOODFUEL	0,035000000	kg/TJ
2017	Cr	1A5a	HEAVY FUEL OIL (S<1%)	0,001000000	kg/TJ
2017	Cr	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000113473	kg/TJ
2017	Cr	1A5a	OTHER PETROLEUM PRODUCTS	0,001000000	kg/TJ

## Cu Implied emission factors in Finnish air pollutant inventory for 2017

2017	Cu	1A1a	ANIMAL-BASED FUELS	0,000664559	kg/TJ
2017	Cu	1A1a	BARK	0,010028570	kg/TJ
2017	Cu	1A1a	CHIPS FROM ROUNDWOOD	0,010732163	kg/TJ
2017	Cu	1A1a	COAL (S=1.0%)	0,001890325	kg/TJ
2017	Cu	1A1a	DEINKING WASTE	0,039805189	kg/TJ
2017	Cu	1A1a	DEMOLITION WOOD	0,004674517	kg/TJ
2017	Cu	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,051000000	kg/TJ
2017	Cu	1A1a	FOREST RESIDUE CHIPS	0,010359508	kg/TJ
2017	Cu	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000111378	kg/TJ
2017	Cu	1A1a	HEAVY FUEL OIL (S<1%)	0,001810834	kg/TJ
2017	Cu	1A1a	INDUSTRIAL WASTE	0,002320182	kg/TJ
2017	Cu	1A1a	MILLED PEAT	0,011979817	kg/TJ
2017	Cu	1A1a	MUNICIPAL WASTE - unsorted	0,013608483	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Cu	1A1a	INDUSTRY	0,003095706	kg/TJ
2017	Cu	1A1a	OTHER FOSSIL LIQUID	0,001000000	kg/TJ
2017	Cu	1A1a	OTHER FOSSIL SOLID	0,003996442	kg/TJ
2017	Cu	1A1a	OTHER NON-FOSSIL SOLID	0,015573380	kg/TJ
2017	Cu	1A1a	OTHER WASTE	0,000808074	kg/TJ
2017	Cu	1A1a	OTHER WOOD RESIDUE	0,013520839	kg/TJ
2017	Cu	1A1a	PEAT PELLETS AND BRIQUETTES	0,007748723	kg/TJ
2017	Cu	1A1a	RECOVERED FUEL (REF 2)	0,002190422	kg/TJ
2017	Cu	1A1a	RECOVERED FUEL (REF 3)	0,002247868	kg/TJ
2017	Cu	1A1a	RECOVERED WOOD	0,002794715	kg/TJ
2017	Cu	1A1a	RECYCLED AND WASTE OILS	0,000576364	kg/TJ
2017	Cu	1A1a	REFUSE-DERIVED FUEL (RDF)	0,002250000	kg/TJ
2017	Cu	1A1a	SALT TREATED WOOD	0,004834891	kg/TJ
2017	Cu	1A1a	SAWDUST AND CUTTER CHIPS	0,009493786	kg/TJ
2017	Cu	1A1a	SOD PEAT	0,208366561	kg/TJ
2017	Cu	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,013900488	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cu	1A1a	FUELS)	0,016058093	kg/TJ
2017	Cu	1A1a	WOOD RESIDUE CHIPS	0,021308660	kg/TJ
2017	Cu	1A1b	HEAVY FUEL OIL (S<1%)	0,001009930	kg/TJ
2017	Cu	1A1b	PETROLEUM COKE	0,350000000	kg/TJ
2017	Cu	1A2a	HEAVY FUEL OIL (S<1%)	0,001961270	kg/TJ
2017	Cu	1A2a	MILLED PEAT	0,220000000	kg/TJ
2017	Cu	1A2a	OTHER FOSSIL LIQUID	0,002500000	kg/TJ
2017	Cu	1A2a	WOOD RESIDUE CHIPS	0,051000000	kg/TJ
2017	Cu	1A2b	HEAVY FUEL OIL (S<1%)	0,000662175	kg/TJ
2017	Cu	1A2c	COAL (S=1.0%)	0,001886710	kg/TJ
2017	Cu	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,002500000	kg/TJ
2017	Cu	1A2c	HEAVY FUEL OIL (S<1%)	0,002490626	kg/TJ
2017	Cu	1A2c	OTHER FOSSIL LIQUID	0,002500000	kg/TJ
2017	Cu	1A2c	PETROLEUM COKE	0,350000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cu	1A2c	FUELS)	0,032270736	kg/TJ
2017	Cu	1A2d	ANIMAL-BASED FUELS	0,004590362	kg/TJ
2017	Cu	1A2d	BARK	0,009972050	kg/TJ
2017	Cu	1A2d	CHIPS FROM ROUNDWOOD	0,004486151	kg/TJ
2017	Cu	1A2d	COAL (S=1.0%)	0,001301506	kg/TJ
2017	Cu	1A2d	DEMOLITION WOOD	0,004523022	kg/TJ
2017	Cu	1A2d	FOREST RESIDUE CHIPS	0,003406580	kg/TJ
2017	Cu	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,001915320	kg/TJ
2017	Cu	1A2d	HEAVY FUEL OIL (S<1%)	0,005583636	kg/TJ

2017	Cu	1A2d	INDUSTRIAL WASTE	0,051000000	kg/TJ
2017	Cu	1A2d	MILLED PEAT	0,000954824	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Cu	1A2d	INDUSTRY	0,007273006	kg/TJ
2017	Cu	1A2d	OTHER NON-FOSSIL SOLID	0,000743743	kg/TJ
2017	Cu	1A2d	OTHER WASTE	0,004701393	kg/TJ
2017	Cu	1A2d	OTHER WOOD RESIDUE	0,048653841	kg/TJ
2017	Cu	1A2d	PLASTIC WASTE	0,000801436	kg/TJ
2017	Cu	1A2d	RECOVERED FUEL (REF 2)	0,023561045	kg/TJ
2017	Cu	1A2d	RECOVERED WOOD	0,010472016	kg/TJ
2017	Cu	1A2d	RECYCLED AND WASTE OILS	0,000904604	kg/TJ
2017	Cu	1A2d	SALT TREATED WOOD	0,004523022	kg/TJ
2017	Cu	1A2d	SAWDUST AND CUTTER CHIPS	0,021195579	kg/TJ
2017	Cu	1A2d	SOD PEAT	0,004564358	kg/TJ
2017	Cu	1A2d	SULPHUR CONCENTRATE	0,007927284	kg/TJ
2017	Cu	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,009007500	kg/TJ
2017	Cu	1A2d	WOOD RESIDUE CHIPS	0,023957738	kg/TJ
2017	Cu	1A2e	ANIMAL-BASED FUELS	0,051000000	kg/TJ
2017	Cu	1A2e	COAL (S=1.0%)	0,003992752	kg/TJ
2017	Cu	1A2e	COKE (S=1.0%)	0,350000000	kg/TJ
2017	Cu	1A2e	FOREST RESIDUE CHIPS	0,051000000	kg/TJ
2017	Cu	1A2e	HEAVY FUEL OIL (S<1%)	0,002526991	kg/TJ
2017	Cu	1A2e	MILLED PEAT	0,147524703	kg/TJ
2017	Cu	1A2e	PEAT PELLETS AND BRIQUETTES	0,001300000	kg/TJ
2017	Cu	1A2e	SAWDUST AND CUTTER CHIPS	0,051000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Cu	1A2e	FUELS)	0,051000000	kg/TJ
2017	Cu	1A2e	WOOD RESIDUE CHIPS	0,051000000	kg/TJ
2017	Cu	1A2f	CHIPS FROM ROUNDWOOD	0,051000000	kg/TJ
2017	Cu	1A2f	COAL (S=1.0%)	0,231964875	kg/TJ
2017	Cu	1A2f	COKE (S=1.0%)	0,350000000	kg/TJ
2017	Cu	1A2f	FOREST RESIDUE CHIPS	0,051000000	kg/TJ
2017	Cu	1A2f	HEAVY FUEL OIL (S<1%)	0,002671228	kg/TJ
2017	Cu	1A2f	PETROLEUM COKE	0,136763600	kg/TJ
2017	Cu	1A2f	RECOVERED FUEL (REF 2)	0,039624492	kg/TJ
2017	Cu	1A2f	RECYCLED AND WASTE OILS	0,001566202	kg/TJ
2017	Cu	1A2f	RUBBER WASTE	0,017632715	kg/TJ
2017	Cu	1A2f	SAWDUST AND CUTTER CHIPS	0,008354659	kg/TJ
2017	Cu	1A2gvii	DIESEL OIL (S=001%)	0,039351852	kg/TJ
2017	Cu	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,040442174	kg/TJ
2017	Cu	1A2gviii	BARK	0,030409497	kg/TJ
2017	Cu	1A2gviii	CHIPS FROM ROUNDWOOD	0,035567182	kg/TJ
2017	Cu	1A2gviii	COAL (S=1.0%)	0,350000000	kg/TJ
2017	Cu	1A2gviii	FOREST RESIDUE CHIPS	0,012137674	kg/TJ
2017	Cu	1A2gviii	HAZARDOUS WASTE	0,000538475	kg/TJ
2017	Cu	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,002500000	kg/TJ
2017	Cu	1A2gviii	HEAVY FUEL OIL (S<1%)	0,002330333	kg/TJ
2017	Cu	1A2gviii	INDUSTRIAL WASTE	0,002250000	kg/TJ
2017	Cu	1A2gviii	MILLED PEAT	0,001530826	kg/TJ
2017	Cu	1A2gviii	MUNICIPAL WASTE - unsorted	0,001311104	kg/TJ
2017	Cu	1A2gviii	OTHER FOSSIL LIQUID	0,002500000	kg/TJ
2017	Cu	1A2gviii	OTHER NON-FOSSIL SOLID	0,005390140	kg/TJ
2017	Cu	1A2gviii	OTHER WOOD RESIDUE	0,016239967	kg/TJ
2017	Cu	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,001962116	kg/TJ
2017	Cu	1A2gviii	RECOVERED FUEL (REF 2)	0,004504505	kg/TJ
2017	Cu	1A2gviii	RECOVERED WOOD	0,004504505	kg/TJ
2017	Cu	1A2gviii	SAWDUST AND CUTTER CHIPS	0,029924043	kg/TJ

2017	Cu	1A2gviii	SOD PEAT	0,210444137	kg/TJ
2017	Cu	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,021979490	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
			FUELS)	0,040461382	kg/TJ
2017	Cu	1A2gviii	WOOD RESIDUE CHIPS	0,025403665	kg/TJ
2017	Cu	1A3bi	DIESEL OIL (S=001%)	0,000133178	kg/TJ
2017	Cu	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000104651	kg/TJ
2017	Cu	1A3bii	DIESEL OIL (S=001%)	0,000133178	kg/TJ
2017	Cu	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000104651	kg/TJ
2017	Cu	1A3biii	DIESEL OIL (S=001%)	0,000133178	kg/TJ
2017	Cu	1A3biv	DIESEL OIL (S=001%)	0,000133178	kg/TJ
2017	Cu	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000104651	kg/TJ
2017	Cu	1A3c	GASOIL (FOR NON-ROAD USE)	0,039351852	kg/TJ
2017	Cu	1A3dii	GASOIL (FOR NON-ROAD USE)	0,020452553	kg/TJ
2017	Cu	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,030838990	kg/TJ
2017	Cu	1A4ai	FOREST WOODFUEL	0,006000000	kg/TJ
2017	Cu	1A4ai	HEAVY FUEL OIL (S<1%)	0,002500000	kg/TJ
2017	Cu	1A4ai	SOD PEAT	0,220000000	kg/TJ
2017	Cu	1A4aii	DIESEL OIL (S=001%)	0,039351852	kg/TJ
2017	Cu	1A4aii	LIQUID GAS	0,036956522	kg/TJ
2017	Cu	1A4aii	MOTOR GASOLINE (S=0.001%)	0,040442174	kg/TJ
2017	Cu	1A4bi	COAL (S=1.0%)	0,175000000	kg/TJ
2017	Cu	1A4bi	FOREST WOODFUEL	0,006000000	kg/TJ
2017	Cu	1A4bi	HEAVY FUEL OIL (S<1%)	0,002500000	kg/TJ
2017	Cu	1A4bi	SOD PEAT	0,220000000	kg/TJ
2017	Cu	1A4bii	DIESEL OIL (S=001%)	0,039351852	kg/TJ
2017	Cu	1A4bii	MOTOR GASOLINE (S=0.001%)	0,040442174	kg/TJ
2017	Cu	1A4ci	COAL (S=1.0%)	0,004000000	kg/TJ
2017	Cu	1A4ci	FOREST WOODFUEL	0,006000000	kg/TJ
2017	Cu	1A4ci	HEAVY FUEL OIL (S<1%)	0,002500000	kg/TJ
2017	Cu	1A4ci	SOD PEAT	0,220000000	kg/TJ
2017	Cu	1A4cii	DIESEL OIL (S=001%)	0,039351852	kg/TJ
2017	Cu	1A4cii	MOTOR GASOLINE (S=0.001%)	0,040442174	kg/TJ
2017	Cu	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,020370370	kg/TJ
2017	Cu	1A5a	FOREST WOODFUEL	0,051000000	kg/TJ
2017	Cu	1A5a	HEAVY FUEL OIL (S<1%)	0,002500000	kg/TJ
2017	Cu	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,002214797	kg/TJ
2017	Cu	1A5a	OTHER PETROLEUM PRODUCTS	0,002500000	kg/TJ

## Ni Implied emission factors in Finnish air pollutant inventory for 2017

2017	Ni	1A1a	ANIMAL-BASED FUELS	0,000652932	kg/TJ
2017	Ni	1A1a	BARK	0,005147747	kg/TJ
2017	Ni	1A1a	CHIPS FROM ROUNDWOOD	0,005782783	kg/TJ
2017	Ni	1A1a	COAL (S=1.0%)	0,001944002	kg/TJ
2017	Ni	1A1a	DEINKING WASTE	0,023492247	kg/TJ
2017	Ni	1A1a	DEMOLITION WOOD	0,002000000	kg/TJ
2017	Ni	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,030000000	kg/TJ
2017	Ni	1A1a	FOREST RESIDUE CHIPS	0,005585883	kg/TJ
2017	Ni	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,001873721	kg/TJ
2017	Ni	1A1a	HEAVY FUEL OIL (S<1%)	0,215824885	kg/TJ
2017	Ni	1A1a	INDUSTRIAL WASTE	0,000545644	kg/TJ
2017	Ni	1A1a	MILLED PEAT	0,007766177	kg/TJ
2017	Ni	1A1a	MUNICIPAL WASTE - unsorted	0,007588926	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Ni	1A1a	INDUSTRY	0,001782103	kg/TJ
2017	Ni	1A1a	OTHER FOSSIL LIQUID	0,004000000	kg/TJ
2017	Ni	1A1a	OTHER FOSSIL SOLID	0,003985406	kg/TJ
2017	Ni	1A1a	OTHER NON-FOSSIL SOLID	0,008477252	kg/TJ
2017	Ni	1A1a	OTHER WASTE	0,002000000	kg/TJ
2017	Ni	1A1a	OTHER WOOD RESIDUE	0,007206893	kg/TJ
2017	Ni	1A1a	PEAT PELLETS AND BRIQUETTES	0,003452652	kg/TJ
2017	Ni	1A1a	RECOVERED FUEL (REF 2)	0,001121946	kg/TJ
2017	Ni	1A1a	RECOVERED FUEL (REF 3)	0,000504006	kg/TJ
2017	Ni	1A1a	RECOVERED WOOD	0,001472463	kg/TJ
2017	Ni	1A1a	RECYCLED AND WASTE OILS	0,004000000	kg/TJ
2017	Ni	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000500000	kg/TJ
2017	Ni	1A1a	SALT TREATED WOOD	0,002000000	kg/TJ
2017	Ni	1A1a	SAWDUST AND CUTTER CHIPS	0,005328072	kg/TJ
2017	Ni	1A1a	SOD PEAT	0,132622177	kg/TJ
2017	Ni	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,009647017	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Ni	1A1a	FUELS)	0,009480200	kg/TJ
2017	Ni	1A1a	WOOD RESIDUE CHIPS	0,012017741	kg/TJ
2017	Ni	1A1b	HEAVY FUEL OIL (S<1%)	0,497187495	kg/TJ
2017	Ni	1A1b	PETROLEUM COKE	0,125870160	kg/TJ
2017	Ni	1A2a	HEAVY FUEL OIL (S<1%)	0,228509134	kg/TJ
2017	Ni	1A2a	MILLED PEAT	0,140000000	kg/TJ
2017	Ni	1A2a	OTHER FOSSIL LIQUID	0,300000000	kg/TJ
2017	Ni	1A2a	WOOD RESIDUE CHIPS	0,030000000	kg/TJ
2017	Ni	1A2b	COAL (S=1.0%)	0,788987071	kg/TJ
2017	Ni	1A2b	HEAVY FUEL OIL (S<1%)	0,079460991	kg/TJ
2017	Ni	1A2c	COAL (S=1.0%)	0,001307597	kg/TJ
2017	Ni	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,300000000	kg/TJ
2017	Ni	1A2c	HEAVY FUEL OIL (S<1%)	0,291591572	kg/TJ
2017	Ni	1A2c	OTHER FOSSIL LIQUID	0,300000000	kg/TJ
2017	Ni	1A2c	PETROLEUM COKE	0,800000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Ni	1A2c	FUELS)	0,018700359	kg/TJ
2017	Ni	1A2d	ANIMAL-BASED FUELS	0,000711772	kg/TJ
2017	Ni	1A2d	BARK	0,002750645	kg/TJ
2017	Ni	1A2d	BLACK LIQUOR	0,001395443	kg/TJ
2017	Ni	1A2d	CHIPS FROM ROUNDWOOD	0,002028405	kg/TJ
2017	Ni	1A2d	COAL (S=1.0%)	0,019491707	kg/TJ
2017	Ni	1A2d	DEMOLITION WOOD	0,000500000	kg/TJ
2017	Ni	1A2d	FOREST RESIDUE CHIPS	0,003265616	kg/TJ

2017	Ni	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,007288349	kg/TJ
2017	Ni	1A2d	HEAVY FUEL OIL (S<1%)	0,054208695	kg/TJ
2017	Ni	1A2d	INDUSTRIAL WASTE	0,030000000	kg/TJ
2017	Ni	1A2d	MILLED PEAT	0,000804125	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Ni	1A2d	INDUSTRY	0,002697961	kg/TJ
2017	Ni	1A2d	OTHER NON-FOSSIL SOLID	0,014278661	kg/TJ
2017	Ni	1A2d	OTHER WASTE	0,001060942	kg/TJ
2017	Ni	1A2d	OTHER WOOD RESIDUE	0,028501890	kg/TJ
2017	Ni	1A2d	PLASTIC WASTE	0,008494112	kg/TJ
2017	Ni	1A2d	RECOVERED FUEL (REF 2)	0,001428834	kg/TJ
2017	Ni	1A2d	RECOVERED WOOD	0,000556755	kg/TJ
2017	Ni	1A2d	RECYCLED AND WASTE OILS	0,001000000	kg/TJ
2017	Ni	1A2d	SALT TREATED WOOD	0,000500000	kg/TJ
2017	Ni	1A2d	SAWDUST AND CUTTER CHIPS	0,010071665	kg/TJ
2017	Ni	1A2d	SOD PEAT	0,004130798	kg/TJ
2017	Ni	1A2d	SULPHUR CONCENTRATE	0,002496458	kg/TJ
2017	Ni	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,005436159	kg/TJ
2017	Ni	1A2d	WOOD RESIDUE CHIPS	0,007472239	kg/TJ
2017	Ni	1A2e	ANIMAL-BASED FUELS	0,030000000	kg/TJ
2017	Ni	1A2e	COAL (S=1.0%)	0,003992752	kg/TJ
2017	Ni	1A2e	COKE (S=1.0%)	0,800000000	kg/TJ
2017	Ni	1A2e	FOREST RESIDUE CHIPS	0,030000000	kg/TJ
2017	Ni	1A2e	HEAVY FUEL OIL (S<1%)	0,303585439	kg/TJ
2017	Ni	1A2e	MILLED PEAT	0,093870318	kg/TJ
2017	Ni	1A2e	PEAT PELLETS AND BRIQUETTES	0,000800000	kg/TJ
2017	Ni	1A2e	SAWDUST AND CUTTER CHIPS	0,030000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Ni	1A2e	FUELS)	0,030000000	kg/TJ
2017	Ni	1A2e	WOOD RESIDUE CHIPS	0,030000000	kg/TJ
2017	Ni	1A2f	CHIPS FROM ROUNDWOOD	0,030000000	kg/TJ
2017	Ni	1A2f	COAL (S=1.0%)	0,524506296	kg/TJ
2017	Ni	1A2f	COKE (S=1.0%)	0,613866536	kg/TJ
2017	Ni	1A2f	FOREST RESIDUE CHIPS	0,030000000	kg/TJ
2017	Ni	1A2f	HEAVY FUEL OIL (S<1%)	0,164760920	kg/TJ
2017	Ni	1A2f	PETROLEUM COKE	0,297825813	kg/TJ
2017	Ni	1A2f	RECOVERED FUEL (REF 2)	0,021300821	kg/TJ
2017	Ni	1A2f	RECYCLED AND WASTE OILS	0,125423073	kg/TJ
2017	Ni	1A2f	RUBBER WASTE	0,004483076	kg/TJ
2017	Ni	1A2f	SAWDUST AND CUTTER CHIPS	0,005664569	kg/TJ
2017	Ni	1A2gvii	DIESEL OIL (S=001%)	0,001620370	kg/TJ
2017	Ni	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,001665266	kg/TJ
2017	Ni	1A2gviii	BARK	0,017681184	kg/TJ
2017	Ni	1A2gviii	CHIPS FROM ROUNDWOOD	0,020988769	kg/TJ
2017	Ni	1A2gviii	COAL (S=1.0%)	0,800000000	kg/TJ
2017	Ni	1A2gviii	FOREST RESIDUE CHIPS	0,006940448	kg/TJ
2017	Ni	1A2gviii	HAZARDOUS WASTE	0,001308686	kg/TJ
2017	Ni	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,300000000	kg/TJ
2017	Ni	1A2gviii	HEAVY FUEL OIL (S<1%)	0,276835810	kg/TJ
2017	Ni	1A2gviii	INDUSTRIAL WASTE	0,000500000	kg/TJ
2017	Ni	1A2gviii	MILLED PEAT	0,000947190	kg/TJ
2017	Ni	1A2gviii	MUNICIPAL WASTE - unsorted	0,000981658	kg/TJ
2017	Ni	1A2gviii	OTHER FOSSIL LIQUID	0,300000000	kg/TJ
2017	Ni	1A2gviii	OTHER NON-FOSSIL SOLID	0,002300028	kg/TJ
2017	Ni	1A2gviii	OTHER WOOD RESIDUE	0,008841719	kg/TJ
2017	Ni	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,003169572	kg/TJ
2017	Ni	1A2gviii	RECOVERED FUEL (REF 2)	0,007125307	kg/TJ



2017	Ni	1A2gviii	RECOVERED WOOD	0,007125307	kg/TJ
2017	Ni	1A2gviii	SAWDUST AND CUTTER CHIPS	0,017550843	kg/TJ
2017	Ni	1A2gviii	SOD PEAT	0,133984480	kg/TJ
2017	Ni	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,012552377	kg/TJ
2017	Ni	1A2gviii	WOOD RESIDUE CHIPS	0,023585189	kg/TJ
2017	Ni	1A2gviii	WOOD RESIDUE CHIPS	0,014452645	kg/TJ
2017	Ni	1A3bi	DIESEL OIL (S=001%)	0,000004673	kg/TJ
2017	Ni	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000053488	kg/TJ
2017	Ni	1A3bii	DIESEL OIL (S=001%)	0,000004673	kg/TJ
2017	Ni	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000053488	kg/TJ
2017	Ni	1A3biii	DIESEL OIL (S=001%)	0,000004673	kg/TJ
2017	Ni	1A3biv	DIESEL OIL (S=001%)	0,000004673	kg/TJ
2017	Ni	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000053488	kg/TJ
2017	Ni	1A3c	GASOIL (FOR NON-ROAD USE)	0,001620370	kg/TJ
2017	Ni	1A3dii	GASOIL (FOR NON-ROAD USE)	0,023241537	kg/TJ
2017	Ni	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,789478154	kg/TJ
2017	Ni	1A4ai	FOREST WOODFUEL	0,030000000	kg/TJ
2017	Ni	1A4ai	HEAVY FUEL OIL (S<1%)	0,300006089	kg/TJ
2017	Ni	1A4ai	SOD PEAT	0,140000000	kg/TJ
2017	Ni	1A4aii	DIESEL OIL (S=001%)	0,001620370	kg/TJ
2017	Ni	1A4aii	LIQUID GAS	0,001521739	kg/TJ
2017	Ni	1A4aii	MOTOR GASOLINE (S=0.001%)	0,001665266	kg/TJ
2017	Ni	1A4bi	COAL (S=1.0%)	0,400000000	kg/TJ
2017	Ni	1A4bi	FOREST WOODFUEL	0,030000000	kg/TJ
2017	Ni	1A4bi	HEAVY FUEL OIL (S<1%)	0,300000000	kg/TJ
2017	Ni	1A4bi	SOD PEAT	0,140000000	kg/TJ
2017	Ni	1A4bii	DIESEL OIL (S=001%)	0,001620370	kg/TJ
2017	Ni	1A4bii	MOTOR GASOLINE (S=0.001%)	0,001665266	kg/TJ
2017	Ni	1A4ci	COAL (S=1.0%)	0,004000000	kg/TJ
2017	Ni	1A4ci	FOREST WOODFUEL	0,030000000	kg/TJ
2017	Ni	1A4ci	HEAVY FUEL OIL (S<1%)	0,300000000	kg/TJ
2017	Ni	1A4ci	SOD PEAT	0,140000000	kg/TJ
2017	Ni	1A4cii	DIESEL OIL (S=001%)	0,001620370	kg/TJ
2017	Ni	1A4cii	MOTOR GASOLINE (S=0.001%)	0,001665266	kg/TJ
2017	Ni	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,023148148	kg/TJ
2017	Ni	1A5a	FOREST WOODFUEL	0,030000000	kg/TJ
2017	Ni	1A5a	HEAVY FUEL OIL (S<1%)	0,300000000	kg/TJ
2017	Ni	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,002022580	kg/TJ
2017	Ni	1A5a	OTHER PETROLEUM PRODUCTS	0,300000000	kg/TJ

## Se Implied emission factors in Finnish air pollutant inventory for 2017

2017	Se	1A2gvii	DIESEL OIL (S=001%)	0,000231481	kg/TJ
2017	Se	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,000237895	kg/TJ
2017	Se	1A3bi	DIESEL OIL (S=001%)	0,000002336	kg/TJ
2017	Se	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000004651	kg/TJ
2017	Se	1A3bii	DIESEL OIL (S=001%)	0,000002336	kg/TJ
2017	Se	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000004651	kg/TJ
2017	Se	1A3biii	DIESEL OIL (S=001%)	0,000002336	kg/TJ
2017	Se	1A3biv	DIESEL OIL (S=001%)	0,000002336	kg/TJ
2017	Se	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000004651	kg/TJ
2017	Se	1A3c	GASOIL (FOR NON-ROAD USE)	0,000231481	kg/TJ
2017	Se	1A3dii	GASOIL (FOR NON-ROAD USE)	0,002324154	kg/TJ
2017	Se	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,005180950	kg/TJ
2017	Se	1A4ai	FOREST WOODFUEL	0,005000000	kg/TJ
2017	Se	1A4aii	DIESEL OIL (S=001%)	0,000231481	kg/TJ
2017	Se	1A4aii	LIQUID GAS	0,000217391	kg/TJ
2017	Se	1A4aii	MOTOR GASOLINE (S=0.001%)	0,000237895	kg/TJ
2017	Se	1A4bi	FOREST WOODFUEL	0,005000000	kg/TJ
2017	Se	1A4bii	DIESEL OIL (S=001%)	0,000231481	kg/TJ
2017	Se	1A4bii	MOTOR GASOLINE (S=0.001%)	0,000237895	kg/TJ
2017	Se	1A4ci	FOREST WOODFUEL	0,005000000	kg/TJ
2017	Se	1A4cii	DIESEL OIL (S=001%)	0,000231481	kg/TJ
2017	Se	1A4cii	MOTOR GASOLINE (S=0.001%)	0,000237895	kg/TJ
2017	Se	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,002314815	kg/TJ
2017	Se	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000203054	kg/TJ

## Zn Implied emission factors in Finnish air pollutant inventory for 2017

2017	Zn	1A1a	ANIMAL-BASED FUELS	0,048439241	kg/TJ
2017	Zn	1A1a	BARK	0,130526323	kg/TJ
2017	Zn	1A1a	CHIPS FROM ROUNDWOOD	0,155119721	kg/TJ
2017	Zn	1A1a	COAL (S=1.0%)	0,016716671	kg/TJ
2017	Zn	1A1a	DEINKING WASTE	0,545120138	kg/TJ
2017	Zn	1A1a	DEMOLITION WOOD	0,063402422	kg/TJ
2017	Zn	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,700000000	kg/TJ
2017	Zn	1A1a	FOREST RESIDUE CHIPS	0,155212263	kg/TJ
2017	Zn	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000749098	kg/TJ
2017	Zn	1A1a	HEAVY FUEL OIL (S<1%)	0,008915731	kg/TJ
2017	Zn	1A1a	INDUSTRIAL WASTE	0,008777153	kg/TJ
2017	Zn	1A1a	MILLED PEAT	0,028945584	kg/TJ
2017	Zn	1A1a	MUNICIPAL WASTE - unsorted	0,174267313	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Zn	1A1a	INDUSTRY	0,045537032	kg/TJ
2017	Zn	1A1a	OTHER FOSSIL LIQUID	0,006000000	kg/TJ
2017	Zn	1A1a	OTHER FOSSIL SOLID	0,083934532	kg/TJ
2017	Zn	1A1a	OTHER NON-FOSSIL SOLID	0,200705326	kg/TJ
2017	Zn	1A1a	OTHER WASTE	0,054000000	kg/TJ
2017	Zn	1A1a	OTHER WOOD RESIDUE	0,172767597	kg/TJ
2017	Zn	1A1a	PEAT PELLETS AND BRIQUETTES	0,015590372	kg/TJ
2017	Zn	1A1a	RECOVERED FUEL (REF 2)	0,349282789	kg/TJ
2017	Zn	1A1a	RECOVERED FUEL (REF 3)	0,007701217	kg/TJ
2017	Zn	1A1a	RECOVERED WOOD	0,346431993	kg/TJ
2017	Zn	1A1a	RECYCLED AND WASTE OILS	0,006000000	kg/TJ
2017	Zn	1A1a	REFUSE-DERIVED FUEL (RDF)	0,007714286	kg/TJ
2017	Zn	1A1a	SALT TREATED WOOD	0,054000000	kg/TJ
2017	Zn	1A1a	SAWDUST AND CUTTER CHIPS	0,150958442	kg/TJ
2017	Zn	1A1a	SOD PEAT	0,312620043	kg/TJ
2017	Zn	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,177968798	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Zn	1A1a	FUELS)	0,115366785	kg/TJ
2017	Zn	1A1a	WOOD RESIDUE CHIPS	0,285645850	kg/TJ
2017	Zn	1A1b	HEAVY FUEL OIL (S<1%)	0,006039721	kg/TJ
2017	Zn	1A1b	PETROLEUM COKE	1,500000000	kg/TJ
2017	Zn	1A2a	HEAVY FUEL OIL (S<1%)	0,013848804	kg/TJ
2017	Zn	1A2a	MILLED PEAT	0,330000000	kg/TJ
2017	Zn	1A2a	OTHER FOSSIL LIQUID	0,012000000	kg/TJ
2017	Zn	1A2a	WOOD RESIDUE CHIPS	0,700000000	kg/TJ
2017	Zn	1A2b	HEAVY FUEL OIL (S<1%)	0,000987366	kg/TJ
2017	Zn	1A2c	COAL (S=1.0%)	0,012978112	kg/TJ
2017	Zn	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,012000000	kg/TJ
2017	Zn	1A2c	HEAVY FUEL OIL (S<1%)	0,011959591	kg/TJ
2017	Zn	1A2c	OTHER FOSSIL LIQUID	0,012000000	kg/TJ
2017	Zn	1A2c	PETROLEUM COKE	1,500000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Zn	1A2c	FUELS)	0,433680182	kg/TJ
2017	Zn	1A2d	ANIMAL-BASED FUELS	0,014248967	kg/TJ
2017	Zn	1A2d	BARK	0,038703648	kg/TJ
2017	Zn	1A2d	CHIPS FROM ROUNDWOOD	0,068392065	kg/TJ
2017	Zn	1A2d	COAL (S=1.0%)	0,011869191	kg/TJ
2017	Zn	1A2d	DEMOLITION WOOD	0,007714286	kg/TJ
2017	Zn	1A2d	FOREST RESIDUE CHIPS	0,050786704	kg/TJ
2017	Zn	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,151435954	kg/TJ
2017	Zn	1A2d	HEAVY FUEL OIL (S<1%)	0,021259057	kg/TJ

2017	Zn	1A2d	INDUSTRIAL WASTE	0,700000000	kg/TJ
2017	Zn	1A2d	MILLED PEAT	0,005527757	kg/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	Zn	1A2d	INDUSTRY	0,130399785	kg/TJ
2017	Zn	1A2d	OTHER NON-FOSSIL SOLID	0,009062110	kg/TJ
2017	Zn	1A2d	OTHER WASTE	0,025023354	kg/TJ
2017	Zn	1A2d	OTHER WOOD RESIDUE	0,667934581	kg/TJ
2017	Zn	1A2d	PLASTIC WASTE	0,030417457	kg/TJ
2017	Zn	1A2d	RECOVERED FUEL (REF 2)	0,024082372	kg/TJ
2017	Zn	1A2d	RECOVERED WOOD	0,019418594	kg/TJ
2017	Zn	1A2d	RECYCLED AND WASTE OILS	0,000857143	kg/TJ
2017	Zn	1A2d	SALT TREATED WOOD	0,007714286	kg/TJ
2017	Zn	1A2d	SAWDUST AND CUTTER CHIPS	0,193502494	kg/TJ
2017	Zn	1A2d	SOD PEAT	0,008994117	kg/TJ
2017	Zn	1A2d	SULPHUR CONCENTRATE	0,111316659	kg/TJ
2017	Zn	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,106723992	kg/TJ
2017	Zn	1A2d	WOOD RESIDUE CHIPS	0,035865713	kg/TJ
2017	Zn	1A2e	ANIMAL-BASED FUELS	0,700000000	kg/TJ
2017	Zn	1A2e	COAL (S=1.0%)	0,083974761	kg/TJ
2017	Zn	1A2e	COKE (S=1.0%)	1,500000000	kg/TJ
2017	Zn	1A2e	FOREST RESIDUE CHIPS	0,700000000	kg/TJ
2017	Zn	1A2e	HEAVY FUEL OIL (S<1%)	0,012053064	kg/TJ
2017	Zn	1A2e	MILLED PEAT	0,223291972	kg/TJ
2017	Zn	1A2e	PEAT PELLETS AND BRIQUETTES	0,008000000	kg/TJ
2017	Zn	1A2e	SAWDUST AND CUTTER CHIPS	0,700000000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	Zn	1A2e	FUELS)	0,700000000	kg/TJ
2017	Zn	1A2e	WOOD RESIDUE CHIPS	0,700000000	kg/TJ
2017	Zn	1A2f	CHIPS FROM ROUNDWOOD	0,700000000	kg/TJ
2017	Zn	1A2f	COAL (S=1.0%)	1,007582488	kg/TJ
2017	Zn	1A2f	COKE (S=1.0%)	1,500000000	kg/TJ
2017	Zn	1A2f	FOREST RESIDUE CHIPS	0,700000000	kg/TJ
2017	Zn	1A2f	HEAVY FUEL OIL (S<1%)	0,009223896	kg/TJ
2017	Zn	1A2f	PETROLEUM COKE	0,601076837	kg/TJ
2017	Zn	1A2f	RECOVERED FUEL (REF 2)	0,479766964	kg/TJ
2017	Zn	1A2f	RECYCLED AND WASTE OILS	0,008443357	kg/TJ
2017	Zn	1A2f	RUBBER WASTE	0,054000000	kg/TJ
2017	Zn	1A2f	SAWDUST AND CUTTER CHIPS	0,128245026	kg/TJ
2017	Zn	1A2gvii	DIESEL OIL (S=001%)	0,023148148	kg/TJ
2017	Zn	1A2gvii	MOTOR GASOLINE (S=0.001%)	0,023789514	kg/TJ
2017	Zn	1A2gviii	BARK	0,411002457	kg/TJ
2017	Zn	1A2gviii	CHIPS FROM ROUNDWOOD	0,468511342	kg/TJ
2017	Zn	1A2gviii	COAL (S=1.0%)	1,500000000	kg/TJ
2017	Zn	1A2gviii	FOREST RESIDUE CHIPS	0,153275987	kg/TJ
2017	Zn	1A2gviii	HAZARDOUS WASTE	0,700000000	kg/TJ
2017	Zn	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,012000000	kg/TJ
2017	Zn	1A2gviii	HEAVY FUEL OIL (S<1%)	0,011479721	kg/TJ
2017	Zn	1A2gviii	INDUSTRIAL WASTE	0,007714286	kg/TJ
2017	Zn	1A2gviii	MILLED PEAT	0,008338447	kg/TJ
2017	Zn	1A2gviii	MUNICIPAL WASTE - unsorted	0,035016485	kg/TJ
2017	Zn	1A2gviii	OTHER FOSSIL LIQUID	0,012000000	kg/TJ
2017	Zn	1A2gviii	OTHER NON-FOSSIL SOLID	0,059905724	kg/TJ
2017	Zn	1A2gviii	OTHER WOOD RESIDUE	0,211848237	kg/TJ
2017	Zn	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,012000000	kg/TJ
2017	Zn	1A2gviii	RECOVERED FUEL (REF 2)	0,700000000	kg/TJ
2017	Zn	1A2gviii	RECOVERED WOOD	0,700000000	kg/TJ
2017	Zn	1A2gviii	SAWDUST AND CUTTER CHIPS	0,406610927	kg/TJ

2017	Zn	1A2gviii	SOD PEAT	0,315586875	kg/TJ
2017	Zn	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,291266716	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
			FUELS)	0,552001146	kg/TJ
2017	Zn	1A2gviii	WOOD RESIDUE CHIPS	0,338144620	kg/TJ
2017	Zn	1A3bi	DIESEL OIL (S=001%)	0,000420561	kg/TJ
2017	Zn	1A3bi	MOTOR GASOLINE (S=0.001%)	0,000767442	kg/TJ
2017	Zn	1A3bii	DIESEL OIL (S=001%)	0,000420561	kg/TJ
2017	Zn	1A3bii	MOTOR GASOLINE (S=0.001%)	0,000767442	kg/TJ
2017	Zn	1A3biii	DIESEL OIL (S=001%)	0,000420561	kg/TJ
2017	Zn	1A3biv	DIESEL OIL (S=001%)	0,000420561	kg/TJ
2017	Zn	1A3biv	MOTOR GASOLINE (S=0.001%)	0,000767442	kg/TJ
2017	Zn	1A3c	GASOIL (FOR NON-ROAD USE)	0,023148148	kg/TJ
2017	Zn	1A3dii	GASOIL (FOR NON-ROAD USE)	0,027889845	kg/TJ
2017	Zn	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,029605431	kg/TJ
2017	Zn	1A4ai	FOREST WOODFUEL	0,700000000	kg/TJ
2017	Zn	1A4ai	HEAVY FUEL OIL (S<1%)	0,012000000	kg/TJ
2017	Zn	1A4ai	SOD PEAT	0,330000000	kg/TJ
2017	Zn	1A4aii	DIESEL OIL (S=001%)	0,023148148	kg/TJ
2017	Zn	1A4aii	LIQUID GAS	0,021739130	kg/TJ
2017	Zn	1A4aii	MOTOR GASOLINE (S=0.001%)	0,023789514	kg/TJ
2017	Zn	1A4bi	COAL (S=1.0%)	0,750000000	kg/TJ
2017	Zn	1A4bi	FOREST WOODFUEL	0,700000000	kg/TJ
2017	Zn	1A4bi	HEAVY FUEL OIL (S<1%)	0,012000000	kg/TJ
2017	Zn	1A4bi	SOD PEAT	0,330000000	kg/TJ
2017	Zn	1A4bii	DIESEL OIL (S=001%)	0,023148148	kg/TJ
2017	Zn	1A4bii	MOTOR GASOLINE (S=0.001%)	0,023789514	kg/TJ
2017	Zn	1A4ci	COAL (S=1.0%)	0,084000000	kg/TJ
2017	Zn	1A4ci	FOREST WOODFUEL	0,700000000	kg/TJ
2017	Zn	1A4ci	HEAVY FUEL OIL (S<1%)	0,012000000	kg/TJ
2017	Zn	1A4ci	SOD PEAT	0,330000000	kg/TJ
2017	Zn	1A4cii	DIESEL OIL (S=001%)	0,023148148	kg/TJ
2017	Zn	1A4cii	MOTOR GASOLINE (S=0.001%)	0,023789514	kg/TJ
2017	Zn	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,027777778	kg/TJ
2017	Zn	1A5a	FOREST WOODFUEL	0,700000000	kg/TJ
2017	Zn	1A5a	HEAVY FUEL OIL (S<1%)	0,012000000	kg/TJ
2017	Zn	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,002670255	kg/TJ
2017	Zn	1A5a	OTHER PETROLEUM PRODUCTS	0,012000000	kg/TJ

## PCDD/F Implied emission factors in Finnish air pollutant inventory for 2017

2017	PCDD/F	1A1a	ANIMAL-BASED FUELS	0,000005327	g/TJ
2017	PCDD/F	1A1a	BARK	0,000020587	g/TJ
2017	PCDD/F	1A1a	BIOGAS FROM WASTEWATER TREATMENT	0,000000500	g/TJ
2017	PCDD/F	1A1a	BLAST FURNACE GAS	0,000000500	g/TJ
2017	PCDD/F	1A1a	CHIPS FROM ROUNDWOOD	0,000018821	g/TJ
2017	PCDD/F	1A1a	COAL (S=1.0%)	0,000003540	g/TJ
2017	PCDD/F	1A1a	COKE OVEN GAS	0,000000500	g/TJ
2017	PCDD/F	1A1a	DEINKING WASTE	0,000041250	g/TJ
2017	PCDD/F	1A1a	DEMOLITION WOOD	0,000041250	g/TJ
2017	PCDD/F	1A1a	DIESEL OIL (S=001%)	0,000000500	g/TJ
2017	PCDD/F	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,000021000	g/TJ
2017	PCDD/F	1A1a	FOREST RESIDUE CHIPS	0,000018804	g/TJ
2017	PCDD/F	1A1a	GASOIL (FOR NON-ROAD USE)	0,000000487	g/TJ
2017	PCDD/F	1A1a	HEAVY FUEL OIL (normal, S>1%)	0,000000403	g/TJ
2017	PCDD/F	1A1a	HEAVY FUEL OIL (S<1%)	0,000000394	g/TJ
2017	PCDD/F	1A1a	HYDROGEN	0,000000500	g/TJ
2017	PCDD/F	1A1a	INDUSTRIAL BIOGAS	0,000000500	g/TJ
2017	PCDD/F	1A1a	INDUSTRIAL WASTE	0,000040315	g/TJ
2017	PCDD/F	1A1a	LANDFILL GAS	0,000000500	g/TJ
2017	PCDD/F	1A1a	LIGHT FUEL OIL (S=0.0915%)	0,000000497	g/TJ
2017	PCDD/F	1A1a	LIQUID BIOFUELS	0,000000500	g/TJ
2017	PCDD/F	1A1a	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A1a	MILLED PEAT	0,000016790	g/TJ
2017	PCDD/F	1A1a	MUNICIPAL WASTE - unsorted	0,000046575	g/TJ
2017	PCDD/F	1A1a	NATURAL GAS	0,000000497	g/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	PCDD/F	1A1a	INDUSTRY	0,000020919	g/TJ
2017	PCDD/F	1A1a	OTHER FOSSIL GAS	0,000000181	g/TJ
2017	PCDD/F	1A1a	OTHER FOSSIL LIQUID	0,000000400	g/TJ
2017	PCDD/F	1A1a	OTHER FOSSIL SOLID	0,000003976	g/TJ
2017	PCDD/F	1A1a	OTHER NON-FOSSIL GAS	0,000000500	g/TJ
2017	PCDD/F	1A1a	OTHER NON-FOSSIL SOLID	0,000021000	g/TJ
2017	PCDD/F	1A1a	OTHER WASTE	0,000041250	g/TJ
2017	PCDD/F	1A1a	OTHER WOOD RESIDUE	0,000021000	g/TJ
2017	PCDD/F	1A1a	OXYGEN STEEL FURNACE GAS	0,000000500	g/TJ
2017	PCDD/F	1A1a	PEAT PELLETS AND BRIQUETTES	0,000000002	g/TJ
2017	PCDD/F	1A1a	RECOVERED FUEL (REF 2)	0,000037358	g/TJ
2017	PCDD/F	1A1a	RECOVERED FUEL (REF 3)	0,000040321	g/TJ
2017	PCDD/F	1A1a	RECOVERED WOOD	0,000020996	g/TJ
2017	PCDD/F	1A1a	RECYCLED AND WASTE OILS	0,000000400	g/TJ
2017	PCDD/F	1A1a	REFINERY GAS	0,000000500	g/TJ
2017	PCDD/F	1A1a	REFUSE-DERIVED FUEL (RDF)	0,000185000	g/TJ
2017	PCDD/F	1A1a	SALT TREATED WOOD	0,000041250	g/TJ
2017	PCDD/F	1A1a	SAWDUST AND CUTTER CHIPS	0,000019743	g/TJ
2017	PCDD/F	1A1a	SOD PEAT	0,000017500	g/TJ
2017	PCDD/F	1A1a	TALL PITCH AND OIL	0,000000400	g/TJ
2017	PCDD/F	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000020791	g/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PCDD/F	1A1a	FUELS)	0,000020295	g/TJ
2017	PCDD/F	1A1a	WOOD RESIDUE CHIPS	0,000020797	g/TJ
2017	PCDD/F	1A1b	DIESEL OIL (S=001%)	0,000000500	g/TJ
2017	PCDD/F	1A1b	GASOIL (FOR NON-ROAD USE)	0,000000500	g/TJ
2017	PCDD/F	1A1b	HEAVY FUEL OIL (S<1%)	0,000000400	g/TJ
2017	PCDD/F	1A1b	LIQUID BIOFUELS	0,000000500	g/TJ
2017	PCDD/F	1A1b	LIQUID GAS	0,000000500	g/TJ

2017	PCDD/F	1A1b	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A1b	OTHER FOSSIL GAS	0,000000500	g/TJ
2017	PCDD/F	1A1b	OTHER MEDIUM DISTILLATES	0,000000500	g/TJ
2017	PCDD/F	1A1b	PETROLEUM COKE	0,000004000	g/TJ
2017	PCDD/F	1A1b	REFINERY GAS	0,000000500	g/TJ
2017	PCDD/F	1A2a	BLAST FURNACE GAS	0,000000187	g/TJ
2017	PCDD/F	1A2a	COKE OVEN GAS	0,000000284	g/TJ
2017	PCDD/F	1A2a	DIESEL OIL (S=001%)	0,000000500	g/TJ
2017	PCDD/F	1A2a	GASOIL (FOR NON-ROAD USE)	0,000000481	g/TJ
2017	PCDD/F	1A2a	HEAVY FUEL OIL (S<1%)	0,000000400	g/TJ
2017	PCDD/F	1A2a	LIGHT FUEL OIL (S=0.0915%)	0,000000500	g/TJ
2017	PCDD/F	1A2a	LIQUID GAS	0,000000445	g/TJ
2017	PCDD/F	1A2a	MILLED PEAT	0,000017500	g/TJ
2017	PCDD/F	1A2a	NATURAL GAS	0,000000480	g/TJ
2017	PCDD/F	1A2a	OTHER FOSSIL LIQUID	0,000000400	g/TJ
2017	PCDD/F	1A2a	OXYGEN STEEL FURNACE GAS	0,000000456	g/TJ
2017	PCDD/F	1A2a	WOOD RESIDUE CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A2b	COAL (S=1.0%)	0,000000055	g/TJ
2017	PCDD/F	1A2b	COKE (S=1.0%)	0,000004000	g/TJ
2017	PCDD/F	1A2b	GASOIL (FOR NON-ROAD USE)	0,000000500	g/TJ
2017	PCDD/F	1A2b	HEAVY FUEL OIL (S<1%)	0,000000327	g/TJ
2017	PCDD/F	1A2b	LIGHT FUEL OIL (S=0.0915%)	0,000000442	g/TJ
2017	PCDD/F	1A2b	LIQUID GAS	0,000000496	g/TJ
2017	PCDD/F	1A2b	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2b	OTHER FOSSIL SOLID	0,000004000	g/TJ
2017	PCDD/F	1A2b	RECYCLED AND WASTE OILS	0,000000400	g/TJ
2017	PCDD/F	1A2c	COAL (S=1.0%)	0,000004000	g/TJ
2017	PCDD/F	1A2c	GASOIL (FOR NON-ROAD USE)	0,000000500	g/TJ
2017	PCDD/F	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,000000400	g/TJ
2017	PCDD/F	1A2c	HEAVY FUEL OIL (S<1%)	0,000000238	g/TJ
2017	PCDD/F	1A2c	HYDROGEN	0,000000500	g/TJ
2017	PCDD/F	1A2c	INDUSTRIAL BIOGAS	0,000000500	g/TJ
2017	PCDD/F	1A2c	LIGHT FUEL OIL (S=0.0915%)	0,000000496	g/TJ
2017	PCDD/F	1A2c	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A2c	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2c	OTHER FOSSIL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2c	OTHER FOSSIL LIQUID	0,000000400	g/TJ
2017	PCDD/F	1A2c	OTHER MEDIUM DISTILLATES	0,000000500	g/TJ
2017	PCDD/F	1A2c	OTHER NON-FOSSIL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2c	PETROLEUM COKE	0,000004000	g/TJ
2017	PCDD/F	1A2c	REFINERY GAS	0,000000500	g/TJ
2017	PCDD/F	1A2c	TALL PITCH AND OIL	0,000000400	g/TJ
2017	PCDD/F	1A2c	WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,000021000	g/TJ
2017	PCDD/F	1A2d	ANIMAL-BASED FUELS	0,000021000	g/TJ
2017	PCDD/F	1A2d	AROMATIC GAS	0,000000500	g/TJ
2017	PCDD/F	1A2d	BARK	0,000019678	g/TJ
2017	PCDD/F	1A2d	CHIPS FROM ROUNDWOOD	0,000015326	g/TJ
2017	PCDD/F	1A2d	COAL (S=1.0%)	0,000004000	g/TJ
2017	PCDD/F	1A2d	DEMOLITION WOOD	0,000041250	g/TJ
2017	PCDD/F	1A2d	FOREST RESIDUE CHIPS	0,000016507	g/TJ
2017	PCDD/F	1A2d	GASOIL (FOR NON-ROAD USE)	0,000000500	g/TJ
2017	PCDD/F	1A2d	HEAVY FUEL OIL (normal, S>1%)	0,000000400	g/TJ
2017	PCDD/F	1A2d	HEAVY FUEL OIL (S<1%)	0,000002729	g/TJ
2017	PCDD/F	1A2d	HYDROGEN	0,000000500	g/TJ
2017	PCDD/F	1A2d	INDUSTRIAL BIOGAS	0,000000500	g/TJ
2017	PCDD/F	1A2d	INDUSTRIAL WASTE	0,000041250	g/TJ

2017	PCDD/F	1A2d	LANDFILL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2d	LIGHT FUEL OIL (S=0.0915%)	0,000000477	g/TJ
2017	PCDD/F	1A2d	LIQUID BIOFUELS	0,000000500	g/TJ
2017	PCDD/F	1A2d	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A2d	METHANOL	0,000002020	g/TJ
2017	PCDD/F	1A2d	MILLED PEAT	0,000016342	g/TJ
2017	PCDD/F	1A2d	NATURAL GAS	0,000000561	g/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	PCDD/F	1A2d	INDUSTRY	0,000020640	g/TJ
2017	PCDD/F	1A2d	OTHER NON-FOSSIL SOLID	0,000021000	g/TJ
2017	PCDD/F	1A2d	OTHER WASTE	0,000041250	g/TJ
2017	PCDD/F	1A2d	OTHER WOOD RESIDUE	0,000021000	g/TJ
2017	PCDD/F	1A2d	PLASTIC WASTE	0,000041250	g/TJ
2017	PCDD/F	1A2d	RECOVERED FUEL (REF 2)	0,000049092	g/TJ
2017	PCDD/F	1A2d	RECOVERED WOOD	0,000019575	g/TJ
2017	PCDD/F	1A2d	RECYCLED AND WASTE OILS	0,000000400	g/TJ
2017	PCDD/F	1A2d	SALT TREATED WOOD	0,000041250	g/TJ
2017	PCDD/F	1A2d	SAWDUST AND CUTTER CHIPS	0,000019789	g/TJ
2017	PCDD/F	1A2d	SOD PEAT	0,000017500	g/TJ
2017	PCDD/F	1A2d	SULPHUR CONCENTRATE	0,000021000	g/TJ
2017	PCDD/F	1A2d	TALL PITCH AND OIL	0,000000469	g/TJ
2017	PCDD/F	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000021000	g/TJ
2017	PCDD/F	1A2d	WOOD RESIDUE CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A2e	ANIMAL-BASED FUELS	0,000021000	g/TJ
2017	PCDD/F	1A2e	COAL (S=1.0%)	0,000004000	g/TJ
2017	PCDD/F	1A2e	COKE (S=1.0%)	0,000004000	g/TJ
2017	PCDD/F	1A2e	DIESEL OIL (S=001%)	0,000000500	g/TJ
2017	PCDD/F	1A2e	FOREST RESIDUE CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A2e	GASOIL (FOR NON-ROAD USE)	0,000000500	g/TJ
2017	PCDD/F	1A2e	HEAVY FUEL OIL (S<1%)	0,000000400	g/TJ
2017	PCDD/F	1A2e	INDUSTRIAL BIOGAS	0,000000500	g/TJ
2017	PCDD/F	1A2e	LIGHT FUEL OIL (S=0.0915%)	0,000000500	g/TJ
2017	PCDD/F	1A2e	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A2e	MILLED PEAT	0,000017500	g/TJ
2017	PCDD/F	1A2e	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2e	OTHER NON-FOSSIL LIQUID	0,000000400	g/TJ
2017	PCDD/F	1A2e	PEAT PELLETS AND BRIQUETTES	0,000017500	g/TJ
2017	PCDD/F	1A2e	SAWDUST AND CUTTER CHIPS	0,000021000	g/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PCDD/F	1A2e	FUELS)	0,000021000	g/TJ
2017	PCDD/F	1A2e	WOOD RESIDUE CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A2f	CHIPS FROM ROUNDWOOD	0,000021000	g/TJ
2017	PCDD/F	1A2f	COAL (S=1.0%)	0,000003532	g/TJ
2017	PCDD/F	1A2f	COKE (S=1.0%)	0,000004000	g/TJ
2017	PCDD/F	1A2f	COKE OVEN GAS	0,000000500	g/TJ
2017	PCDD/F	1A2f	DIESEL OIL (S=001%)	0,000000500	g/TJ
2017	PCDD/F	1A2f	FOREST RESIDUE CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A2f	GASOIL (FOR NON-ROAD USE)	0,000000444	g/TJ
2017	PCDD/F	1A2f	HEAVY FUEL OIL (S<1%)	0,000000334	g/TJ
2017	PCDD/F	1A2f	INDUSTRIAL BIOGAS	0,000000500	g/TJ
2017	PCDD/F	1A2f	LANDFILL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2f	LIGHT FUEL OIL (S=0.0915%)	0,000000500	g/TJ
2017	PCDD/F	1A2f	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A2f	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2f	OXYGEN STEEL FURNACE GAS	0,000000500	g/TJ
2017	PCDD/F	1A2f	PETROLEUM COKE	0,000002783	g/TJ
2017	PCDD/F	1A2f	RECOVERED FUEL (REF 2)	0,000034511	g/TJ



2017	PCDD/F	1A2f	RECYCLED AND WASTE OILS	0,00000386	g/TJ
2017	PCDD/F	1A2f	RUBBER WASTE	0,000021483	g/TJ
2017	PCDD/F	1A2f	SAWDUST AND CUTTER CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	BARK	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	BIOGAS FROM WASTEWATER TREATMENT	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	CHIPS FROM ROUNDWOOD	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	COAL (S=1.0%)	0,000004000	g/TJ
2017	PCDD/F	1A2gviii	DIESEL OIL (S=001%)	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	FOREST RESIDUE CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	GASIFIED WASTE	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	GASOIL (FOR NON-ROAD USE)	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	HAZARDOUS WASTE	0,000001115	g/TJ
2017	PCDD/F	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	0,000000400	g/TJ
2017	PCDD/F	1A2gviii	HEAVY FUEL OIL (S<1%)	0,000000394	g/TJ
2017	PCDD/F	1A2gviii	INDUSTRIAL BIOGAS	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	INDUSTRIAL WASTE	0,000041250	g/TJ
2017	PCDD/F	1A2gviii	LANDFILL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	0,000000453	g/TJ
2017	PCDD/F	1A2gviii	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	MILLED PEAT	0,000017500	g/TJ
2017	PCDD/F	1A2gviii	MUNICIPAL WASTE - unsorted	0,000077192	g/TJ
2017	PCDD/F	1A2gviii	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	OTHER FOSSIL LIQUID	0,000000400	g/TJ
2017	PCDD/F	1A2gviii	OTHER NON-FOSSIL GAS	0,000000500	g/TJ
2017	PCDD/F	1A2gviii	OTHER NON-FOSSIL LIQUID	0,000000400	g/TJ
2017	PCDD/F	1A2gviii	OTHER NON-FOSSIL SOLID	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	OTHER WOOD RESIDUE	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	0,000000400	g/TJ
2017	PCDD/F	1A2gviii	RECOVERED FUEL (REF 2)	0,000041250	g/TJ
2017	PCDD/F	1A2gviii	RECOVERED WOOD	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	SAWDUST AND CUTTER CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	SOD PEAT	0,000017500	g/TJ
2017	PCDD/F	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	0,000021000	g/TJ
2017	PCDD/F	1A2gviii	WOOD RESIDUE CHIPS	0,000021000	g/TJ
2017	PCDD/F	1A3dii	GASOIL (FOR NON-ROAD USE)	0,000003021	g/TJ
2017	PCDD/F	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,000011595	g/TJ
2017	PCDD/F	1A3ei	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A4ai	FOREST WOODFUEL	0,000021000	g/TJ
2017	PCDD/F	1A4ai	GASOIL (FOR NON-ROAD USE)	0,000000500	g/TJ
2017	PCDD/F	1A4ai	HEAVY FUEL OIL (S<1%)	0,000000400	g/TJ
2017	PCDD/F	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,000000500	g/TJ
2017	PCDD/F	1A4ai	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A4ai	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A4ai	SOD PEAT	0,000017500	g/TJ
2017	PCDD/F	1A4bi	COAL (S=1.0%)	0,000002000	g/TJ
2017	PCDD/F	1A4bi	FOREST WOODFUEL	0,000021000	g/TJ
2017	PCDD/F	1A4bi	HEAVY FUEL OIL (S<1%)	0,000000400	g/TJ
2017	PCDD/F	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,000000500	g/TJ
2017	PCDD/F	1A4bi	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A4bi	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A4bi	PARAFFIN	0,000000500	g/TJ
2017	PCDD/F	1A4bi	SOD PEAT	0,000017500	g/TJ
2017	PCDD/F	1A4ci	COAL (S=1.0%)	0,000004000	g/TJ
2017	PCDD/F	1A4ci	FOREST WOODFUEL	0,000021000	g/TJ
2017	PCDD/F	1A4ci	HEAVY FUEL OIL (S<1%)	0,000000400	g/TJ

2017	PCDD/F	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,000000500	g/TJ
2017	PCDD/F	1A4ci	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A4ci	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A4ci	SOD PEAT	0,000017500	g/TJ
2017	PCDD/F	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,000003009	g/TJ
2017	PCDD/F	1A5a	FOREST WOODFUEL	0,000021000	g/TJ
2017	PCDD/F	1A5a	HEAVY FUEL OIL (S<1%)	0,000000400	g/TJ
2017	PCDD/F	1A5a	LANDFILL GAS	0,000000500	g/TJ
2017	PCDD/F	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000000761	g/TJ
2017	PCDD/F	1A5a	LIQUID GAS	0,000000500	g/TJ
2017	PCDD/F	1A5a	NATURAL GAS	0,000000500	g/TJ
2017	PCDD/F	1A5a	OTHER PETROLEUM PRODUCTS	0,000000400	g/TJ

## PAH-4 Implied emission factors in Finnish air pollutant inventory for 2017

2017	PAH-4	1A1a	ANIMAL-BASED FUELS	3,179911681	g/TJ
2017	PAH-4	1A1a	BARK	2,700666342	g/TJ
2017	PAH-4	1A1a	CHIPS FROM ROUNDWOOD	2,713593221	g/TJ
2017	PAH-4	1A1a	COAL (S=1.0%)	0,010497074	g/TJ
2017	PAH-4	1A1a	DEINKING WASTE	2,500000000	g/TJ
2017	PAH-4	1A1a	DEMOLITION WOOD	2,500000000	g/TJ
2017	PAH-4	1A1a	DIESEL OIL (S=001%)	2,800000000	g/TJ
2017	PAH-4	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	2,700000000	g/TJ
2017	PAH-4	1A1a	FOREST RESIDUE CHIPS	2,729802334	g/TJ
2017	PAH-4	1A1a	GASOIL (FOR NON-ROAD USE)	2,767362732	g/TJ
2017	PAH-4	1A1a	HEAVY FUEL OIL (normal, S>1%)	2,800000000	g/TJ
2017	PAH-4	1A1a	HEAVY FUEL OIL (S<1%)	2,773710698	g/TJ
2017	PAH-4	1A1a	INDUSTRIAL WASTE	2,499694432	g/TJ
2017	PAH-4	1A1a	LIGHT FUEL OIL (S=0.0915%)	2,869145918	g/TJ
2017	PAH-4	1A1a	LIQUID BIOFUELS	2,800000000	g/TJ
2017	PAH-4	1A1a	MILLED PEAT	0,998165044	g/TJ
2017	PAH-4	1A1a	MUNICIPAL WASTE - unsorted	27,178040342	g/TJ
			OTHER BY-PRODUCTS FROM WOOD PROCESSING		
2017	PAH-4	1A1a	INDUSTRY	2,699957616	g/TJ
2017	PAH-4	1A1a	OTHER FOSSIL LIQUID	2,800000000	g/TJ
2017	PAH-4	1A1a	OTHER FOSSIL SOLID	0,011995118	g/TJ
2017	PAH-4	1A1a	OTHER NON-FOSSIL SOLID	2,700000000	g/TJ
2017	PAH-4	1A1a	OTHER WASTE	2,500000000	g/TJ
2017	PAH-4	1A1a	OTHER WOOD RESIDUE	2,700000000	g/TJ
2017	PAH-4	1A1a	PEAT PELLETS AND BRIQUETTES	0,975419289	g/TJ
2017	PAH-4	1A1a	RECOVERED FUEL (REF 2)	2,500133836	g/TJ
2017	PAH-4	1A1a	RECOVERED FUEL (REF 3)	2,499871478	g/TJ
2017	PAH-4	1A1a	RECOVERED WOOD	2,699965883	g/TJ
2017	PAH-4	1A1a	RECYCLED AND WASTE OILS	2,800000000	g/TJ
2017	PAH-4	1A1a	REFUSE-DERIVED FUEL (RDF)	34,000000000	g/TJ
2017	PAH-4	1A1a	SALT TREATED WOOD	2,500000000	g/TJ
2017	PAH-4	1A1a	SAWDUST AND CUTTER CHIPS	2,696757416	g/TJ
2017	PAH-4	1A1a	SOD PEAT	0,999999112	g/TJ
2017	PAH-4	1A1a	TALL PITCH AND OIL	2,800000000	g/TJ
2017	PAH-4	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	2,705706928	g/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED WOOD		
2017	PAH-4	1A1a	FUELS)	2,286119785	g/TJ
2017	PAH-4	1A1a	WOOD RESIDUE CHIPS	2,701393704	g/TJ
2017	PAH-4	1A1b	DIESEL OIL (S=001%)	2,800000000	g/TJ
2017	PAH-4	1A1b	GASOIL (FOR NON-ROAD USE)	2,800000000	g/TJ
2017	PAH-4	1A1b	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A1b	LIQUID BIOFUELS	2,800000000	g/TJ
2017	PAH-4	1A1b	OTHER MEDIUM DISTILLATES	2,800000000	g/TJ
2017	PAH-4	1A1b	PETROLEUM COKE	0,012000000	g/TJ
2017	PAH-4	1A2a	COKE (S=1.0%)	0,000852103	g/TJ
2017	PAH-4	1A2a	DIESEL OIL (S=001%)	2,800000000	g/TJ
2017	PAH-4	1A2a	GASOIL (FOR NON-ROAD USE)	2,799720142	g/TJ
2017	PAH-4	1A2a	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A2a	LIGHT FUEL OIL (S=0.0915%)	2,800000000	g/TJ
2017	PAH-4	1A2a	MILLED PEAT	1,000000000	g/TJ
2017	PAH-4	1A2a	OTHER FOSSIL LIQUID	2,800000000	g/TJ
2017	PAH-4	1A2a	OTHER FOSSIL SOLID	0,012000000	g/TJ
2017	PAH-4	1A2a	WOOD RESIDUE CHIPS	2,700000000	g/TJ
2017	PAH-4	1A2b	COAL (S=1.0%)	0,012000000	g/TJ
2017	PAH-4	1A2b	COKE (S=1.0%)	0,012000000	g/TJ

2017	PAH-4	1A2b	GASOIL (FOR NON-ROAD USE)	2,800000000	g/TJ
2017	PAH-4	1A2b	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A2b	LIGHT FUEL OIL (S=0.0915%)	2,800000000	g/TJ
2017	PAH-4	1A2b	OTHER FOSSIL SOLID	0,012000000	g/TJ
2017	PAH-4	1A2b	RECYCLED AND WASTE OILS	2,800000000	g/TJ
2017	PAH-4	1A2c	COAL (S=1.0%)	0,012000000	g/TJ
2017	PAH-4	1A2c	GASOIL (FOR NON-ROAD USE)	2,800000000	g/TJ
2017	PAH-4	1A2c	HEAVY FUEL OIL (normal, S>1%)	0,705417607	g/TJ
2017	PAH-4	1A2c	HEAVY FUEL OIL (S<1%)	2,791125807	g/TJ
2017	PAH-4	1A2c	LIGHT FUEL OIL (S=0.0915%)	2,736858036	g/TJ
2017	PAH-4	1A2c	OTHER FOSSIL LIQUID	2,800000000	g/TJ
2017	PAH-4	1A2c	OTHER MEDIUM DISTILLATES	2,800000000	g/TJ
2017	PAH-4	1A2c	PETROLEUM COKE	0,012000000	g/TJ
2017	PAH-4	1A2c	TALL PITCH AND OIL WOOD PELLETS AND BRIQUETTES (REFINED WOOD FUELS)	2,800000000	g/TJ
2017	PAH-4	1A2c	FUELS)	2,700000000	g/TJ
2017	PAH-4	1A2d	ANIMAL-BASED FUELS	2,700000000	g/TJ
2017	PAH-4	1A2d	BARK	2,268212158	g/TJ
2017	PAH-4	1A2d	CHIPS FROM ROUNDWOOD	2,700000000	g/TJ
2017	PAH-4	1A2d	COAL (S=1.0%)	0,009317698	g/TJ
2017	PAH-4	1A2d	DEMOLITION WOOD	2,500000000	g/TJ
2017	PAH-4	1A2d	FOREST RESIDUE CHIPS	2,500286000	g/TJ
2017	PAH-4	1A2d	GASOIL (FOR NON-ROAD USE)	2,603747179	g/TJ
2017	PAH-4	1A2d	HEAVY FUEL OIL (normal, S>1%)	4,753889641	g/TJ
2017	PAH-4	1A2d	HEAVY FUEL OIL (S<1%)	3,158946996	g/TJ
2017	PAH-4	1A2d	INDUSTRIAL WASTE	2,500000000	g/TJ
2017	PAH-4	1A2d	LIGHT FUEL OIL (S=0.0915%)	2,681808199	g/TJ
2017	PAH-4	1A2d	LIQUID BIOFUELS	2,800000000	g/TJ
2017	PAH-4	1A2d	METHANOL	11,512169894	g/TJ
2017	PAH-4	1A2d	MILLED PEAT OTHER BY-PRODUCTS FROM WOOD PROCESSING INDUSTRY	0,855561407	g/TJ
2017	PAH-4	1A2d	INDUSTRY	2,738730205	g/TJ
2017	PAH-4	1A2d	OTHER NON-FOSSIL SOLID	2,700000000	g/TJ
2017	PAH-4	1A2d	OTHER WASTE	2,500000000	g/TJ
2017	PAH-4	1A2d	OTHER WOOD RESIDUE	2,700000000	g/TJ
2017	PAH-4	1A2d	PLASTIC WASTE	2,500000000	g/TJ
2017	PAH-4	1A2d	RECOVERED FUEL (REF 2)	2,500000000	g/TJ
2017	PAH-4	1A2d	RECOVERED WOOD	2,700000000	g/TJ
2017	PAH-4	1A2d	RECYCLED AND WASTE OILS	2,800000000	g/TJ
2017	PAH-4	1A2d	SALT TREATED WOOD	2,500000000	g/TJ
2017	PAH-4	1A2d	SAWDUST AND CUTTER CHIPS	2,621079803	g/TJ
2017	PAH-4	1A2d	SOD PEAT	1,000000000	g/TJ
2017	PAH-4	1A2d	SULPHUR CONCENTRATE	2,700000000	g/TJ
2017	PAH-4	1A2d	TALL PITCH AND OIL	2,851636942	g/TJ
2017	PAH-4	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	2,700000000	g/TJ
2017	PAH-4	1A2d	WOOD RESIDUE CHIPS	2,700000000	g/TJ
2017	PAH-4	1A2e	ANIMAL-BASED FUELS	2,700000000	g/TJ
2017	PAH-4	1A2e	COAL (S=1.0%)	0,012000000	g/TJ
2017	PAH-4	1A2e	COKE (S=1.0%)	0,012000000	g/TJ
2017	PAH-4	1A2e	DIESEL OIL (S=001%)	2,800000000	g/TJ
2017	PAH-4	1A2e	FOREST RESIDUE CHIPS	2,700000000	g/TJ
2017	PAH-4	1A2e	GASOIL (FOR NON-ROAD USE)	2,800000000	g/TJ
2017	PAH-4	1A2e	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A2e	LIGHT FUEL OIL (S=0.0915%)	2,800000000	g/TJ
2017	PAH-4	1A2e	MILLED PEAT	1,000000000	g/TJ
2017	PAH-4	1A2e	OTHER NON-FOSSIL LIQUID	2,800000000	g/TJ
2017	PAH-4	1A2e	PEAT PELLETS AND BRIQUETTES	1,000000000	g/TJ

2017	PAH-4	1A2e	SAWDUST AND CUTTER CHIPS WOOD PELLETS AND BRIQUETTES (REFINED WOOD	2,700000000	g/TJ
2017	PAH-4	1A2e	FUELS)	2,700000000	g/TJ
2017	PAH-4	1A2e	WOOD RESIDUE CHIPS	2,700000000	g/TJ
2017	PAH-4	1A2f	CHIPS FROM ROUNDWOOD	2,700000000	g/TJ
2017	PAH-4	1A2f	COAL (S=1.0%)	0,012000000	g/TJ
2017	PAH-4	1A2f	COKE (S=1.0%)	0,012000000	g/TJ
2017	PAH-4	1A2f	DIESEL OIL (S=001%)	2,800000000	g/TJ
2017	PAH-4	1A2f	FOREST RESIDUE CHIPS	2,700000000	g/TJ
2017	PAH-4	1A2f	GASOIL (FOR NON-ROAD USE)	2,800000000	g/TJ
2017	PAH-4	1A2f	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A2f	LIGHT FUEL OIL (S=0.0915%)	2,800000000	g/TJ
2017	PAH-4	1A2f	PETROLEUM COKE	0,012000000	g/TJ
2017	PAH-4	1A2f	RECOVERED FUEL (REF 2)	2,500000000	g/TJ
2017	PAH-4	1A2f	RECYCLED AND WASTE OILS	2,800000000	g/TJ
2017	PAH-4	1A2f	RUBBER WASTE	2,500000000	g/TJ
2017	PAH-4	1A2f	SAWDUST AND CUTTER CHIPS	2,700000000	g/TJ
2017	PAH-4	1A2gvii	DIESEL OIL (S=001%)	1,851851852	g/TJ
2017	PAH-4	1A2gvii	MOTOR GASOLINE (S=0.001%)	1,903161127	g/TJ
2017	PAH-4	1A2gviii	BARK	2,700000000	g/TJ
2017	PAH-4	1A2gviii	CHIPS FROM ROUNDWOOD	2,700000000	g/TJ
2017	PAH-4	1A2gviii	COAL (S=1.0%)	0,012000000	g/TJ
2017	PAH-4	1A2gviii	DIESEL OIL (S=001%)	2,800000000	g/TJ
2017	PAH-4	1A2gviii	FOREST RESIDUE CHIPS	2,700000000	g/TJ
2017	PAH-4	1A2gviii	GASOIL (FOR NON-ROAD USE)	2,800000000	g/TJ
2017	PAH-4	1A2gviii	HAZARDOUS WASTE	2,500000000	g/TJ
2017	PAH-4	1A2gviii	HEAVY FUEL OIL (normal, S>1%)	2,800000000	g/TJ
2017	PAH-4	1A2gviii	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A2gviii	INDUSTRIAL WASTE	2,500000000	g/TJ
2017	PAH-4	1A2gviii	LIGHT FUEL OIL (S=0.0915%)	2,800000000	g/TJ
2017	PAH-4	1A2gviii	MILLED PEAT	1,000000000	g/TJ
2017	PAH-4	1A2gviii	MUNICIPAL WASTE - unsorted	34,000000000	g/TJ
2017	PAH-4	1A2gviii	OTHER FOSSIL LIQUID	2,800000000	g/TJ
2017	PAH-4	1A2gviii	OTHER NON-FOSSIL LIQUID	2,800000000	g/TJ
2017	PAH-4	1A2gviii	OTHER NON-FOSSIL SOLID	2,700000000	g/TJ
2017	PAH-4	1A2gviii	OTHER WOOD RESIDUE	2,700000000	g/TJ
2017	PAH-4	1A2gviii	PURIFIED RECYCLED AND WASTE OILS	2,800000000	g/TJ
2017	PAH-4	1A2gviii	RECOVERED FUEL (REF 2)	2,500000000	g/TJ
2017	PAH-4	1A2gviii	RECOVERED WOOD	2,700000000	g/TJ
2017	PAH-4	1A2gviii	SAWDUST AND CUTTER CHIPS	2,700000000	g/TJ
2017	PAH-4	1A2gviii	SOD PEAT	1,000000000	g/TJ
2017	PAH-4	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE WOOD PELLETS AND BRIQUETTES (REFINED WOOD	2,700000000	g/TJ
2017	PAH-4	1A2gviii	FUELS)	2,700000000	g/TJ
2017	PAH-4	1A2gviii	WOOD RESIDUE CHIPS	2,700000000	g/TJ
2017	PAH-4	1A3c	GASOIL (FOR NON-ROAD USE)	1,851851852	g/TJ
2017	PAH-4	1A4ai	FOREST WOODFUEL	9,565000000	g/TJ
2017	PAH-4	1A4ai	GASOIL (FOR NON-ROAD USE)	2,800000000	g/TJ
2017	PAH-4	1A4ai	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A4ai	LIGHT FUEL OIL (S=0.0915%)	2,800000000	g/TJ
2017	PAH-4	1A4ai	SOD PEAT	1,000000000	g/TJ
2017	PAH-4	1A4aii	DIESEL OIL (S=001%)	1,851851852	g/TJ
2017	PAH-4	1A4aii	LIQUID GAS	1,739130435	g/TJ
2017	PAH-4	1A4aii	MOTOR GASOLINE (S=0.001%)	1,903161127	g/TJ
2017	PAH-4	1A4bi	COAL (S=1.0%)	0,006000000	g/TJ
2017	PAH-4	1A4bi	FOREST WOODFUEL	154,664879239	g/TJ
2017	PAH-4	1A4bi	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ

2017	PAH-4	1A4bi	LIGHT FUEL OIL (S=0.0915%)	2,800000000	g/TJ
2017	PAH-4	1A4bi	PARAFFIN	2,800000000	g/TJ
2017	PAH-4	1A4bi	SOD PEAT	1,000000000	g/TJ
2017	PAH-4	1A4bii	DIESEL OIL (S=001%)	1,851851852	g/TJ
2017	PAH-4	1A4bii	MOTOR GASOLINE (S=0.001%)	1,903161127	g/TJ
2017	PAH-4	1A4ci	COAL (S=1.0%)	0,012000000	g/TJ
2017	PAH-4	1A4ci	FOREST WOODFUEL	10,000000000	g/TJ
2017	PAH-4	1A4ci	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A4ci	LIGHT FUEL OIL (S=0.0915%)	2,800000000	g/TJ
2017	PAH-4	1A4ci	SOD PEAT	1,000000000	g/TJ
2017	PAH-4	1A4cii	DIESEL OIL (S=001%)	1,851851852	g/TJ
2017	PAH-4	1A4cii	MOTOR GASOLINE (S=0.001%)	1,903161127	g/TJ
2017	PAH-4	1A5a	FOREST WOODFUEL	2,700000000	g/TJ
2017	PAH-4	1A5a	HEAVY FUEL OIL (S<1%)	2,800000000	g/TJ
2017	PAH-4	1A5a	LIGHT FUEL OIL (S=0.0915%)	2,821236651	g/TJ
2017	PAH-4	1A5a	OTHER PETROLEUM PRODUCTS	2,800000000	g/TJ

## HCB Implied emission factors in Finnish air pollutant inventory for 2017

2017	HCB	1A1a	BARK	0,000005000	kg/TJ
2017	HCB	1A1a	CHIPS FROM ROUNDWOOD	0,000005000	kg/TJ
2017	HCB	1A1a	COAL (S=1.0%)	0,000000007	kg/TJ
2017	HCB	1A1a	DEMOLITION WOOD	0,000005000	kg/TJ
2017	HCB	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,000005000	kg/TJ
2017	HCB	1A1a	FOREST RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A1a	OTHER NON-FOSSIL SOLID	0,000005000	kg/TJ
2017	HCB	1A1a	OTHER WOOD RESIDUE	0,000005000	kg/TJ
2017	HCB	1A1a	RECOVERED WOOD	0,000005000	kg/TJ
2017	HCB	1A1a	SAWDUST AND CUTTER CHIPS	0,000005000	kg/TJ
2017	HCB	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000005000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED		
2017	HCB	1A1a	WOOD FUELS)	0,000005000	kg/TJ
2017	HCB	1A1a	WOOD RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A2a	COKE (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2a	OTHER FOSSIL SOLID	0,000000620	kg/TJ
2017	HCB	1A2a	WOOD RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A2b	COAL (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2b	COKE (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2b	OTHER FOSSIL SOLID	0,000000620	kg/TJ
2017	HCB	1A2c	COAL (S=1.0%)	0,000000620	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED		
2017	HCB	1A2c	WOOD FUELS)	0,000005000	kg/TJ
2017	HCB	1A2d	BARK	0,000005000	kg/TJ
2017	HCB	1A2d	CHIPS FROM ROUNDWOOD	0,000005000	kg/TJ
2017	HCB	1A2d	COAL (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2d	DEMOLITION WOOD	0,000005000	kg/TJ
2017	HCB	1A2d	FOREST RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A2d	OTHER NON-FOSSIL SOLID	0,000005000	kg/TJ
2017	HCB	1A2d	OTHER WOOD RESIDUE	0,000005000	kg/TJ
2017	HCB	1A2d	RECOVERED WOOD	0,000005000	kg/TJ
2017	HCB	1A2d	SAWDUST AND CUTTER CHIPS	0,000005000	kg/TJ
2017	HCB	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000005000	kg/TJ
2017	HCB	1A2d	WOOD RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A2e	COAL (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2e	COKE (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2e	FOREST RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A2e	SAWDUST AND CUTTER CHIPS	0,000005000	kg/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED		
2017	HCB	1A2e	WOOD FUELS)	0,000005000	kg/TJ
2017	HCB	1A2e	WOOD RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A2f	CHIPS FROM ROUNDWOOD	0,000005000	kg/TJ
2017	HCB	1A2f	COAL (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2f	COKE (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2f	FOREST RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A2f	SAWDUST AND CUTTER CHIPS	0,000005000	kg/TJ
2017	HCB	1A2gviii	BARK	0,000005000	kg/TJ
2017	HCB	1A2gviii	CHIPS FROM ROUNDWOOD	0,000005000	kg/TJ
2017	HCB	1A2gviii	COAL (S=1.0%)	0,000000620	kg/TJ
2017	HCB	1A2gviii	FOREST RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A2gviii	OTHER NON-FOSSIL SOLID	0,000005000	kg/TJ
2017	HCB	1A2gviii	OTHER WOOD RESIDUE	0,000005000	kg/TJ
2017	HCB	1A2gviii	RECOVERED WOOD	0,000005000	kg/TJ
2017	HCB	1A2gviii	SAWDUST AND CUTTER CHIPS	0,000005000	kg/TJ
2017	HCB	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000005000	kg/TJ

			WOOD PELLETS AND BRIQUETTES (REFINED		
2017	HCB	1A2gviii	WOOD FUELS)	0,000005000	kg/TJ
2017	HCB	1A2gviii	WOOD RESIDUE CHIPS	0,000005000	kg/TJ
2017	HCB	1A3dii	GASOIL (FOR NON-ROAD USE)	0,000001859	kg/TJ
2017	HCB	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,000003454	kg/TJ
2017	HCB	1A4ai	FOREST WOODFUEL	0,000005000	kg/TJ
2017	HCB	1A4bi	COAL (S=1.0%)	0,000009804	kg/TJ
2017	HCB	1A4bi	FOREST WOODFUEL	0,000005000	kg/TJ
2017	HCB	1A4ci	COAL (S=1.0%)	0,000019608	kg/TJ
2017	HCB	1A4ci	FOREST WOODFUEL	0,000005000	kg/TJ
2017	HCB	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,000001852	kg/TJ
2017	HCB	1A5a	FOREST WOODFUEL	0,000001000	kg/TJ
2017	HCB	1A5a	LIGHT FUEL OIL (S=0.0915%)	0,000000160	kg/TJ



## PCB Implied emission factors in Finnish air pollutant inventory for 2017

2017	PCB	1A1a	BARK	0,003500000	g/TJ
2017	PCB	1A1a	CHIPS FROM ROUNDWOOD	0,003500000	g/TJ
2017	PCB	1A1a	COAL (S=1.0%)	0,000003300	g/TJ
2017	PCB	1A1a	DEMOLITION WOOD	0,003500000	g/TJ
2017	PCB	1A1a	FIREWOOD (STEMS AND SPLIT FIREWOOD)	0,003500000	g/TJ
2017	PCB	1A1a	FOREST RESIDUE CHIPS	0,003500000	g/TJ
2017	PCB	1A1a	OTHER NON-FOSSIL SOLID	0,003500000	g/TJ
2017	PCB	1A1a	OTHER WOOD RESIDUE	0,003500000	g/TJ
2017	PCB	1A1a	RECOVERED WOOD	0,003500000	g/TJ
2017	PCB	1A1a	SAWDUST AND CUTTER CHIPS	0,003500000	g/TJ
2017	PCB	1A1a	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,003500000	g/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED		
2017	PCB	1A1a	WOOD FUELS)	0,003500000	g/TJ
2017	PCB	1A1a	WOOD RESIDUE CHIPS	0,003500000	g/TJ
2017	PCB	1A2a	COKE (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2a	OTHER FOSSIL SOLID	0,170000000	g/TJ
2017	PCB	1A2a	WOOD RESIDUE CHIPS	0,000060000	g/TJ
2017	PCB	1A2b	COAL (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2b	COKE (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2b	OTHER FOSSIL SOLID	0,170000000	g/TJ
2017	PCB	1A2c	COAL (S=1.0%)	0,170000000	g/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED		
2017	PCB	1A2c	WOOD FUELS)	0,000060000	g/TJ
2017	PCB	1A2d	BARK	0,000060000	g/TJ
2017	PCB	1A2d	CHIPS FROM ROUNDWOOD	0,000060000	g/TJ
2017	PCB	1A2d	COAL (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2d	DEMOLITION WOOD	0,000060000	g/TJ
2017	PCB	1A2d	FOREST RESIDUE CHIPS	0,000060000	g/TJ
2017	PCB	1A2d	OTHER NON-FOSSIL SOLID	0,000060000	g/TJ
2017	PCB	1A2d	OTHER WOOD RESIDUE	0,000060000	g/TJ
2017	PCB	1A2d	RECOVERED WOOD	0,000060000	g/TJ
2017	PCB	1A2d	SAWDUST AND CUTTER CHIPS	0,000060000	g/TJ
2017	PCB	1A2d	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000060000	g/TJ
2017	PCB	1A2d	WOOD RESIDUE CHIPS	0,000060000	g/TJ
2017	PCB	1A2e	COAL (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2e	COKE (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2e	FOREST RESIDUE CHIPS	0,000060000	g/TJ
2017	PCB	1A2e	SAWDUST AND CUTTER CHIPS	0,000060000	g/TJ
			WOOD PELLETS AND BRIQUETTES (REFINED		
2017	PCB	1A2e	WOOD FUELS)	0,000060000	g/TJ
2017	PCB	1A2e	WOOD RESIDUE CHIPS	0,000060000	g/TJ
2017	PCB	1A2f	CHIPS FROM ROUNDWOOD	0,000060000	g/TJ
2017	PCB	1A2f	COAL (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2f	COKE (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2f	FOREST RESIDUE CHIPS	0,000060000	g/TJ
2017	PCB	1A2f	SAWDUST AND CUTTER CHIPS	0,000060000	g/TJ
2017	PCB	1A2gviii	BARK	0,000060000	g/TJ
2017	PCB	1A2gviii	CHIPS FROM ROUNDWOOD	0,000060000	g/TJ
2017	PCB	1A2gviii	COAL (S=1.0%)	0,170000000	g/TJ
2017	PCB	1A2gviii	FOREST RESIDUE CHIPS	0,000060000	g/TJ
2017	PCB	1A2gviii	OTHER NON-FOSSIL SOLID	0,000060000	g/TJ
2017	PCB	1A2gviii	OTHER WOOD RESIDUE	0,000060000	g/TJ
2017	PCB	1A2gviii	RECOVERED WOOD	0,000060000	g/TJ
2017	PCB	1A2gviii	SAWDUST AND CUTTER CHIPS	0,000060000	g/TJ
2017	PCB	1A2gviii	UNSPECIFIED INDUSTRIAL WOOD RESIDUE	0,000060000	g/TJ

				WOOD PELLETS AND BRIQUETTES (REFINED	
2017	PCB	1A2gviii	WOOD FUELS)	0,000060000	g/TJ
2017	PCB	1A2gviii	WOOD RESIDUE CHIPS	0,000060000	g/TJ
2017	PCB	1A3dii	GASOIL (FOR NON-ROAD USE)	0,000883178	g/TJ
2017	PCB	1A3dii	HEAVY FUEL OIL (normal, S>1%)	0,014062580	g/TJ
2017	PCB	1A4ai	FOREST WOODFUEL	0,060000000	g/TJ
2017	PCB	1A4ai	HEAVY FUEL OIL (S<1%)	0,000086436	g/TJ
2017	PCB	1A4ai	LIGHT FUEL OIL (S=0.0915%)	0,000083469	g/TJ
2017	PCB	1A4ai	SOD PEAT	0,000058894	g/TJ
2017	PCB	1A4bi	COAL (S=1.0%)	0,000088235	g/TJ
2017	PCB	1A4bi	FOREST WOODFUEL	0,060000000	g/TJ
2017	PCB	1A4bi	HEAVY FUEL OIL (S<1%)	0,000087591	g/TJ
2017	PCB	1A4bi	LIGHT FUEL OIL (S=0.0915%)	0,000084309	g/TJ
2017	PCB	1A4bi	SOD PEAT	0,000073171	g/TJ
2017	PCB	1A4ci	COAL (S=1.0%)	0,000176471	g/TJ
2017	PCB	1A4ci	FOREST WOODFUEL	0,060000000	g/TJ
2017	PCB	1A4ci	HEAVY FUEL OIL (S<1%)	0,000087591	g/TJ
2017	PCB	1A4ci	LIGHT FUEL OIL (S=0.0915%)	0,000017174	g/TJ
2017	PCB	1A4ci	SOD PEAT	0,000073171	g/TJ
2017	PCB	1A4ciii	GASOIL (FOR NON-ROAD USE)	0,000879630	g/TJ

## **Annex 2**

### **Emission factor tables for point sources**

## Nitrogen oxides, NO<sub>x</sub>

### Point source emission factors for > 50 MW facilities

Updated September 2006

Source: Päästötietojen tuottamismenetelmät - Energiantuotanto (10.6.2004) (www.ymparisto.fi > Yritykset ja yhteisöt > Päästöt > Päästökisterit > Päästötiedon tuottaminen > Aineistoa päästöjen määrittämiseen > Energiantuotanto). in Finnish

NO <sub>x</sub> -emission factors	15-50 MW		
	Fuel	Combustion technology	Emission factor mg/MJ
Coal >50%	All	170	1
Peat >50%	Grate	200	1
	BFB	160	1
	CFB	120	1
	Gasification	220	1
Wood >50%	Grate	140	1
	BFB	120	1
	CFB	100	1
	Gasification	170	1
Mixed burning. no fuel more than 50 %	Grate	200	1
	BFB	160	1
	CFB	120	1
	Gasification	220	1
Natural gas	Burner	70	1
Heavy fuel oil	Burner	180	1
Light fuel oil	Burner	100	1
Gas turbines. natural gas		150	1
Gas motor (SG)/ double fuel (DF)		160	1
Gas diesel motor (GD), Gas		1500	1
Oil diesel motor (CI)		2000	1

Source:

1. Jalovaara, J.; Aho J.; Hietamäki E.; Hyytiä V.; Paras käytettävissä oleva tekniikka (BAT) 5-50 MW:n polttolaitoksissa Suomessa, Suomen Ympäristö 649, Suomen ympäristökeskus, Helsinki 2003 (In Finnish)

- Tables pp. 16-19. Tyypilliset ominaispäästökertoimet pienissä polttolaitoksissa

## NM VOC, non-methane volatile organic compounds

### Point source emission factors for > 50 MW facilities

Updated September 2006

Source: Päästötietojen tuottamismenetelmät – Energiantuotanto (10.6.2004)  
(www.ymparisto.fi > Yritykset ja yhteisöt > Päästöt > Päästörekkisterit)  
> Päästötiedon tuottaminen > Aineistoa päästöjen määrittämiseen > Energiantuotanto). in Finnish

<b>Fuel</b>	<b>Emission factor mg/MJ</b>	<b>Source</b>
Coal	1	1
Natural gas	1	1
Heavy fuel oil	1	1
Light fuel oil	1	1
Peat	2	1
Wood	2	1
Peat fluidized bed	3	1
Wood. fluidized bed	3	1

Source:

1. Expert estimation based on national measurement data

## Carbon monoxide, CO

### Point source emission factors for > 50 MW facilities

Updated September 2006

Source: Päästötietojen tuottamismenetelmät - Energiantuotanto (10.6.2004)

(www.ymparisto.fi > Yritykset ja yhteisöt > Päästöt > Päästörekitrit > Päästötiedon tuottaminen

> Aineistoa päästöjen määrittäminen > Energiantuotanto). in Finnish

Fuel	Combustion technology	Capacity			
		15-50 MW	50-150 MW	150-300 MW	>300 MW
		Emission factor			
		mg/MJ	mg/MJ	mg/MJ	mg/MJ
Coal >80%	Burning			5	5
	Grate	30	30	5	5
	Fluidized bed	30	30	5	5
Coal mixed burning 50-80%	All	30	30	10	10
Peat >80%	Grate	100	30	10	10
	Fluidized bed	100	30	10	10
	Other	30	10	10	10
Peat mixed burning 50-80%	Grate	100	30	10	10
	Fluidized bed	100	30	10	10
	Other	70	30	10	10
Wood >80%	Grate	250	250	150	150
	Fluidized bed	150	150	150	150
	Other	250	250	150	150
Wood mixed burning 50-80%	Grate	250	250	70	70
	Fluidized bed	150	150	70	70
	Other	150	150	70	70
Mixed burning no fuel more than 50 %	Grate	100	50	30	30
	Fluidized bed	100	50	30	30
	Other	100	50	30	30
Natural gas	Burning	20	20	20	20
Oil	Burning	20	20	20	20
Gas turbines. natural gas		20	20	20	20

## Polychlorinated dioxins and furans, PCDD/PCDF

### Point source emission factors for > 50 MW facilities

Updated September 2006

Source: Päästötietojen tuottamismenetelmät - Energiantuotanto (10.6.2004)  
(www.ymparisto.fi > Yritykset ja yhteisöt > Päästöt > Päästörekisterit > Päästötiedon tuottaminen > Aineistoa päästöjen määrittämiseen > Energiantuotanto). in Finnish

Fuel	PCDD/F-emission factors	
	mg I-TEQ/TJ	Source
Coal	0.004	1*
Heavy fuel oil	0.0004	1*
Light fuel oil	0.0005	1*
Wood	0.021	2*
Peat	0.0175	3
Natural gas	0.0005	4

Sources:

1. Expert estimate based on UNEP (1999). Dioxin and furan inventories. National and regional emissions of PCDD/PCDF. May 1999 (Germany: Investigation of emissions)
2. Expert estimate based on USEPA (1997) Locating and Estimating Air Emissions from Sources of Dioxins and Furans. USEPA. May 1997. Office of Air Quality Planning And Standards
3. Ruuskanen (2000). Mittaukset; Dioksiineja vähentävät ympäristönsuojelukeinot 1990-luvulla ja uudet mahdollisuudet. Juhani Ruuskanen. Ympäristö- ja terveystieteiden tutkimusraportti 3:2000. In Finnish
4. UNEP (2003). UNEP/POPS/INC.7/INF/14: Standardized Toolkit for Identification and quantification of Dioxin and Furan Releases. 1st edition. May 2003.  
[www.pops.int](http://www.pops.int);  
(based on measurements in Belgium. Germany and Switzerland)

**Polyaromatic hydrocarbons , PAH-4  
expressed as the sum of benzo(a)pyrene. benzo(b)fluoranthene,  
benzo(k).fluoranthene and indeno(1.2.3.-cd)pyrene**

**Point source emission factors for > 50 MW facilities**

Updated September 2006

Source: Päästötietojen tuottamismenetelmät - Energiantuotanto (10.6.2004)  
(www.ymparisto.fi > Yritykset ja yhteisöt > Päästöt > Päästörekitterit > Päästötiedon  
tuottaminen > Aineistoa päästöjen määrittämiseen > Energiantuotanto). in Finnish

<b>PAH-4 expressed as the sum of benzo(a)pyrene. benzo(b)fluoranthene. benzo(k)fluoranthene and indeno(1.2.3-cd)pyrene</b>	<b>Emission factor</b>		
	<b>g/t</b>	<b>g/TJ</b>	<b>Source</b>
<b>Fuel</b>			
Coal	0.0003	0.012	1
Heavy fuel oil	0.12	2.8	2
Light fuel oi	0.12	2.8	2
Wood	0.03	2.7	3
Peat		1	4

Sources:

1. Expert estimate based on EEA(2003) Emission Inventory Guidebook
2. Expert estimate based on UBA (1998). Investigation of emissions and abatement measures for persistent organic pollutants in the FRG. Research Report 295 44 365. UBA-\*FB 98-115/e. 75/98
3. Expert estimate based on TNO (1995). Technical paper to the OSPARCOM-HELCOM-UNECE emission Inventory of Heavy Metals and POP. TNO-Report TNO-MEP - 95/247:
4. Expert estimate based on KTM (1988). Energiatuotannon kokonaispäästöt Suomessa, KTM. Energiaosasto. D:162.1988. In Finnish



## Heavy metals

**Arsenic (As), Mercury (Hg), Cadmium (Cd), Chrome (Cr), Copper (Cu), Nickel (Ni), Lead (Pb) and Zinc (Zn)**

### Point source emission factors for > 50 MW facilities

Updated September 2006

Source: Päästötietojen tuottamismenetelmät - Energiantuotanto (10.6.2004) (www.ymparisto.fi > Yritykset ja yhteisöt > Päästöt > Päästörekisterit > Päästötiedon tuottaminen > Aineistoa päästöjen määrittämiseen > Energiantuotanto). in Finnish

Fuel	Emission factors [ $\mu\text{g}/\text{MJ}$ ]				
	no abatement	cyclone	washer	electric filter	electric filter + desulphuration
<b>Arsenic (As)</b>					
Heavy fuel oil	2	1	-	-	
Peat	81	33	11	0.5	
Coal	130	26	17	7.8	1.0
Wood	1	0.3	0.13	0.1	
<b>Mercury (Hg)</b>					
Heavy fuel oil	0.03	0.03	-	-	
Peat	2.6	2.6	2.3	1.3	
Coal	3.7	3.7	3.3	1.4	0.95
Wood	0.5	0.5	0.45	0.5	
<b>Cadmium (Cd)</b>					
Heavy fuel oil	0.3	0.2	-	-	
Peat	2.8	1.1	0.4	0.02	
Coal	18	3.6	2.3	0.2	0.09
Wood	5	2	0.65	0.5	
<b>Chrome (Cr)</b>					
Heavy fuel oil	1	0.5	-	-	
Peat	140	56	18	0.8	
Coal	1000	200	130	5	1.5
Wood	35	9	4.5	2	
<b>Copper (Cu)</b>					
Heavy fuel oil	2.5	1	-	-	
Peat	220	89	29	1.3	
Coal	350	70	45	4	1.8
Wood	51	12.75	12.75	5	

Fuel	Emission factors [ $\mu\text{g}/\text{MJ}$ ]				
	no abatement	cyclone	washer	electric filter	electric filter + desulphuration

### Nickel (Ni)

Fuel	Emission factors [ $\mu\text{g}/\text{MJ}$ ]				
	Heavy fuel oil	300	150	-	-
Peat	140	58	19	0.8	
Coal	800	160	100	4	1
Wood	30	8.5	3.9	2	

### Lead (Pb)

Fuel	Emission factors [ $\mu\text{g}/\text{MJ}$ ]				
	Heavy fuel oil	25	10	-	-
Peat	170	68	22	1	
Coal	790	160	100	3.9	1.2
Wood	45	12	6	3.4	

### Zinc (Zn)

Fuel	Emission factors [ $\mu\text{g}/\text{MJ}$ ]				
	Heavy fuel oil	12	6	-	-
Peat	330	130	43	8	
Coal <sup>(1)</sup>	1500	300	195	84	12
Wood	700	175	175	54	

(1) large variation between facilities although factors are based on measurements

### Vanadium (V)

Fuel	Emission factors [ $\mu\text{g}/\text{MJ}$ ]				
	Heavy fuel oil	1000	450	-	-
Peat	180	74	24	1.1	
Coal	1400	270	180	6.9	3.1
Wood	100	25	13	9	

Sources:

- "NOT ABATED" emission factors are based on expert estimation on the measured heavy metal concentrations in fuels and on a coarse division between the bottom and fly ash .

- Hupa M. et al. (1988). Total emissions from energy production in Finland Hki 1988. Ins.tsto Prosesikemia Ky. Ministry of Trade and Industry. Energy Department. Research Reports D:162. In Finnish.

- Melanen et al. (1999). Raskasmetallien päästöt ilmaan Suomessa 1990-luvulla Suomen ympäristö 329. Suomen ympäristökeskus 1999. p. 86 //Kivihilli: Taulukko 3. Liite 5. (s. 69).Turve: Taulukko 4. Liite 6. (s. 72) . In Finnish
- Kouvo Petri (2003). Formation and control of trace metal emissions in co-firing of biomass, peat and wastes in fluidized bed combustors. Lappeenrannan teknillinen yliopisto. Academic Dissertation. 148. 2003.
- Harju. t. and Munthe. J. (2000). Optimal utilisation of coal in modern power plants with respect to mass flows and emissions of VOC/PAHs and mercury. OMPAC. VTT 31.12.2000. p. 238. Workpackage PIV.1 Field measurement campaign in Helsinki Energy (T. Harju/VTT. J. Munthe/IVL)
- Helsingin Energia/Fortum (2003). Kivihillen kertoimet sähkösuotimen ja rikinpoiston jälkeen perustuvat suomalaisilta laitoksilta saatuihin mittaus-/ominaispäästötietoihin. In Finnish

## **Annex 3**

### **Corrections made to the data taken from VAHTI in 2015**

## **Annex 3. Corrections made to emission data taken from the Finnish Regional ELY Centres' VAHTI database in 2015**

The following corrections and modifications were made to the data reported by the plants to the VAHTI database from where the data was taken to the air emission inventory data system (IPTJ) and checked before use in the inventory (see Chapter 2.3 for description of the process of inventory preparation):

### **1 Fuel use data** (3297 records in the year 2015 data)

- 675 fuel use records were added from emission trading material
- 3 fuel use records were added from other material
- 1829 fuel use records having Vahti data were taken from emission trading material directly on boiler level or according to plant level data
- 790 fuel use records were directly from Vahti database

For 2778 original Vahti fuel use records the following corrections were made (some corrections were also made for the Vahti data corresponding to the above 1829 records from emission trading data in order that the plant level data from emission trading material could be more accurately modified back to boiler level data):

- 45 plant level IDs were modified to accomplish correspondence between Vahti data and energy trading data on plant level
- 43 energy content values (TJ) of fuel use were corrected based on fuel amount values (mass or volume)
- 3 energy content values (TJ) were corrected based on other information (e.g. order of magnitude)
- 31 missing energy content values (TJ) were calculated by using fuel amount values
- 1 missing fuel use records were calculated and added according to the corresponding emission records
- 30 fuel use codes (classifications) were changed
- 10 fuel use record IDs (that identify the emission source, for example, a boiler) were changed to correspond the emission data
- 42 overlapping fuel use records were deleted (corresponding fuel use and emission information was taken from off-road machinery model TYKO)
- 230 monthly reported fuel use records were modified to correspond the year-based data
- 3 fuel use modifications were done
- 1 sulphur content value was corrected
- 411 fuel use records having zero or null values (mass or volume and energy content) were deleted (these values are problematical to the calculation process of the IPTJ)
- In addition, there were 109 fuel use records that had a severe inconsistency between the fuel amount (mass or volume) and energy content (TJ) values.

### **2 Emission data**

- Emission data was calculated for 647 fuel use records added from emission trading material
- All emission data was calculated (no emissions in Vahti) for 89 original fuel use records. Also, there was partly missing emission data in Vahti which was calculated.
- 4 emission values were corrected

- 5 emission parameters were changed
- 38 emission record IDs (that identify the emission source, for example, a boiler) were changed to correspond the fuel use data
- 4 incorrect emissions records were deleted
- 326 overlapping emission records were deleted (corresponding emission information was taken from off-road machinery model TYKO)
- 730 monthly reported emission records were modified to correspond the year-based data
- Almost all emissions reported for E-PRTR in plant level in Vahti were deleted
- Emission records having 0 or null values were deleted

### **3 Combustion (1521 records in 2015) and emission abatement technology data**

- Default values were added for 401 missing fuel capacities (thermal input)
- Other values were added for 101 missing fuel capacities (thermal input)
- 98 values of fuel capacities (thermal input) were corrected
- Default values were added for 387 undefined or missing combustion technologies
- Other values were added for 82 undefined or missing combustion technologies
- 36 values of combustion technologies were corrected
- 61 records of emission abatement technologies were added
- The number of records for which abatement technology data was missing could not be estimated (missing data may mean actually missing data or that there is no abatement technology in use). If no abatement data in Vahti, ESP was used as default technology for grate, fluidized bed and for gasification if thermal input was higher than 5 MW and cyclone was used as default technology for heavy oil burners if thermal input was higher than 1 MW.

## **Annex 4**

### **Basis of Estimation of Emissions from Transport**

**Table F4: Basis for estimating emissions from mobile sources. Please tick off with X.**

<b>NFR09 code</b>	<b>Description</b>	<b>Fuel sold</b>	<b>Fuel used</b>	<b>Comment</b>
1 A 3 a i (i)	International aviation (LTO)	<i>x</i>		
1 A 3 a i (ii)	International aviation (Cruise)	<i>x</i>		
1 A 3 a ii (i)	1 A 3 a ii Civil aviation (Domestic, LTO)	x		
1 A 3 a ii (ii)	1 A 3 a ii Civil Aviation (Domestic, Cruise)	x		
<b>1A3b</b>	<b>Road transport</b>			
1A3c	Railways	<i>x</i>		
1A3di (i)	International maritime navigation	<i>x</i>		
1A3di (ii)	International inland waterways	<i>x</i>		
1A3dii	National navigation	<i>x</i>		
1A4ci	Agriculture	x		
1A4cii	Off-road vehicles and other machinery	x		
1A4ciii	National fishing	x		
1 A 5 b	Other mobile (Including military)	<i>x</i>		



## **Annex 5**

### **Net caloric values and sulphur contents of fuels**

**Table 5.1. Net caloric values by fuel.**

Fuels	NCV	Unit	Source of emission factor
<b>Liquid fuels</b>			
Town gas	16.9	GJ/1000 m3	Neste 1993
Refinery gas (+ other gases)	49 (45-55)	GJ/t	Plant-specific
LPG (liquefied petroleum gas)	46.2	GJ/t	Neste/ET2004
Naphta	44.3	GJ/t	EE
Motor gasoline	43	GJ/t	VTT/Liisa Model/Neste
Aviation gasoline	43.7	GJ/t	EE/Neste
Jet fuel	43.3	GJ/t	EE /Fortum 2002
Other kerosenes (vaporising oil, lamp kerosene)	43.1	GJ/t	EE/IPCC1996
Diesel oil	42.8	GJ/t	VTT/Liisa Model/Neste
Gasoil (light fuel oil, heating fuel oil)	42.7	GJ/t	Neste/EE
Gasoil (for non-road use)	42.8	GJ/t	EE (same as diesel oil)
Residual fuel oil (heavy fuel oil), low sulphur	41.1	GJ/t	Neste/EE
Residual fuel oil (heavy fuel oil), normal	40.5	GJ/t	Neste/EE
Other residual fuel oil (heavy bottom oil)	40.2	GJ/t	Neste/EE
Petroleum coke	33.5 (20-36)	GJ/t	Plant-specific
Recycled waste oil	41	GJ/t	EE (=RFO)
Other petroleum products	35 (30-47)	GJ/t	EE (=RFO)
<b>Solid fuels</b>			
Anthracite	33.5	GJ/t	IPCC1996
Hard coal (bituminous)	25.5 (21-32)	GJ/t	StatFi 2005
Coal briquettes	30	GJ/t	EE
Coal tar	36.5	GJ/t	Plant-specific
Coke	29.3 (25-35)	GJ/t	IPCC1996
Coke oven gas	16.7	GJ/1000 m3	Plant-specific
Blast furnace gas	11.2-11.5 3.6	GJ/1000 m3	Plant-specific
<b>Gaseous fuels</b>			
Natural gas	36	GJ/1000 m3	Gasum 2005
Gasified solid waste*	13.3 (7-30)	GJ/1000 m3	EE
<b>Biomass fuels</b>			
Wood fuels (solid, includes e.g. firewood, bark, chips, sawdust and other industrial wood residues, recycled wood, pellets and briquettes)	7.8–16	GJ/t	IPCC1996
Black and sulphite liquors	7.3–15	GJ/t	IPCC1996
Other by-products from wood processing industry (includes e.g. pine oil and tar, methanol, fibrous sludge, waste paper, stink gas, etc.)	3–37 20	GJ/t GJ/1000 m3	IPCC1996, VTT2045, EE
Plant and animal residues	10-35	GJ/t	EE (=wood)
Biogas (landfill gas, biogas from wastewater treatment, industrial biogas and other biogas)	15–20.5	GJ/1000 m3	EE
Hydrogen	10.8	GJ/1000 m3	
<b>Other fuels, peat</b>			

Peat (milled)	10.1	GJ/t	VTT 2003
Peat (sod peat)	12.3	GJ/t	VTT 2003
Peat (pellets and briquettes)	20.9	GJ/t	VTT 2003
<b>Other fuels, wastes etc.</b>			
Mixed fuels* (REF, RDF, PDF, MSW)	10–21	GJ/t	StatFi 2004
Demolition wood*	8-15	GJ/t	StatFi 2004
Impregnated wood*	12	GJ/t	StatFi 2004
De-inking sludge*	4	GJ/t	EE
Other residues and by-products	30	GJ/t	EE
Plastics waste	33 (25-40)	GJ/t	EE
Rubber waste	33	GJ/t	StatFi 2004
Hazardous waste	15 (10-15)	GJ/t	Ekokem 2004
Other non-specified waste (industrial waste, etc.)	15–30	GJ/t	EE

\* Mixed fuels: contains fossil and non-fossil carbon; the CO<sub>2</sub> emission factor refers only to the fossil fraction of total energy content.

Sources:

EE: expert estimation Kari Grönfors, Statistics Finland

Neste 1993: Composition and properties of natural gas and liquefied petroleum gas (in Finnish)

Neste: product data sheets, personal communications

VTT/Liisa Model: Calculation system of road traffic emissions

StatFi 2004: Mixed fuels in Finland's greenhouse gas inventory and on compilation of the energy statistics (Masters Thesis of Minna Jokinen)

StatFi 2005: Research of Teemu Oinonen (not published, see Annex 3)

Ekokem 2004: Environmental report 2004

Gasum 2005: personal communication

VTT2045: Properties of fuels used in Finland, VTT 2000

Fortum 2002: Composition of kerosenes

VTT 2003: Vesterinen 2003

The default NCVs are practically constant over time. There are some exceptions concerning plant specific fuels like refinery gases, BFG and certain waste-derived fuels. The operators should report to VAHTI system both fuel quantities as well as energy contents of the fuels used. Thus in bottom-up data there are some variations in the NCVs. The annual average values of reported data are compared to the default NCVs. Also plant level NCVs are compared to default NCVs.

Peat is one of the main fuels in Finland. It is the fourth largest fuel (after wood, hard coal and natural gas), representing over 6% of Total primary energy supply (TPES) and over 8% of combustible fuels. Its share is higher than for example the share of any liquid fuel. The share of peat is generally around half of the share of hard coal, but varies considerable, like the share of hard coal, too.

**Table 5.2. Fuel specific sulphur contents.**

Fuel	Fuel	Default S%
11000	Petroleum products	0.21
11108	town gas	0.00001
11109	Other fossile gas	0.004
11110	Refinery gas	0.01
11120	Light distillates	0.00002
11210	Naphtha	0.005
11220	Motor gasoline (S=0.001%)	0.001
11230	Aviation gasoline	0.002
11310	Kerosene (jet fuel)	0.04
11320	Other kerosenes	0.07
11321	motor kerosene	0.07
11322	paraffin oil	0.02
11330	Diesel oil (S=0.001%)	0.001
11340	LFO (S=0.0915%)	0.0915
11350	Gasoil (for non-road use)	0.001
11390	Other medium distillates	0.12
11410	HFO (S<1%)	0.9
11420	HFO (normal, S>1%)	1.4
11430	Other heavy distillates	2.7
11500	Petroleum coke	1
11600	Recycled and waste oils	0.9
11601	Refined recycled and waste oils	0.9
11900	Other petroleum products	1
12110	Anthracite	1.5
12120	Hard coal, bituminous	0.8
12210	Semi-bituminous coal, brown coal, lignite	0.8
12220	Coal briquettes	2
12280	Coal tar	0.25
12290	Other non-specified coal	1
12300	Coke (S=1.0%)	1
12400	Coke oven gas	0.05
12500	Blast furnace gas	0.000001
12600	Converter gas	0.000001
13100	Natural gas	0.0001
21100	Milled peat	0.1
21200	Sod peat	0.11
21300	Peat pellets and briquettes	0.16
31100	Forest fuelwood	0.01
31110	Firewood (stems and split firewood)	0.015
31120	Chips from roundwood	0.01
31130	Forest residue chips	0.01
31210	Bark	0.0165
31220	Sawdust, cutter shavings etc.	0.0075

31230	Wood residue chips	0.008
31231	Plywood residues	0.018
31280	Unspecified industrial wood residue	0.012
31290	Other industrial wood residue	0.012
31301	Black liquor and other concentrated liquors	5
31302	sulphite waste liquor	5
31400	Other by-products from wood processing industry	0.018
31401	tall-oil pitch	0.5
31402	Metanol	1
31403	0-fibre/bio sludge	0.6
31404	Paper	0.038
31406	Odorous gases	15
31409	Other non-fossile liquid	2.5
31500	Recovered wood	0.15
31600	Wood pellets and briquettes	0.009
31700	Vegetable-based fuels	0.075
31800	Animal-based fuels	0.075
32110	Landfill gas	0.01
32120	Biogas from wastewater treatment	0.01
32130	Industrial biogas	0.01
32190	Other biogas (other non-fossile gas)	0.01
32200	Liquid biofuels	0.002
32311	Recovered fuels REF 1-waste sorted according to origin	0.14
32312	Recovered fuels REF 2-waste sorted according to origin	0.12
32313	Recovered fuels REF 3-waste sorted according to origin	0.1
32314	PDF-packaging waste	0.14
32315	RDF-municipal waste, mechanically sorted	0.22
32316	Municipal waste - unsorted	0.25
32320	Demolition wood	0.1
32331	Salt impregnated wood	0.02
32332	Creosote impregnated wood	0.07
32390	Other mixed fuels (other waste)	0.25
32391	Deinking waste	0.08
32400	Gasified waste	0.003
49110	Plastic waste	0.2
49120	Rubber waste	1.5
49130	Hazardous waste	0.1
49190	Other by-products and waste products (industrial waste)	1
49195	Suphur concentrate	10
49200	Exothermic heat from industry (other liquid)	0
49300	Secondary heat from industry	0
49800	Hydrogen	0.000001



## **Annex 6**

### **QA/QC Tools**

# QA/QC Tools for the Finnish Air Pollutant Emissions Inventory

This Annex of the IIR describes the components of the QA/QC toolset for the inventory and aims to deliver a comprehensive overview of their features without technical details. The design parameters for the tools were set in a preliminary research of the challenges in the previously existing quality control measures, most of which were often time and resource –based. The need for the project rose from the complete update of time series of air emissions which was finalized in 2018. As opposed to the previous annual inventories, the new time series required extensive maintenance throughout the whole time series. These tools are supposed to aid in especially time series control, but also to provide means to bring flexibility, agility and reliability in annual inventories.

The developed toolset consists of one main tool for analysing and compiling NFR tables, and several more specified investigation tools for investigating data content of air emission database IPTJ. The tools were mostly developed with Microsoft Excel and SQL Server Management Studio. The check-up routines were originally intended to be implemented in the sequenced query trees in the form of SSIS-packages (developed with Microsoft Business Intelligence Development Studio) that has previously been used as the middleware between IPTJ and NFR tables. However, during the development, a methodology for creating a reliable and adjustable SQL-based connection between SQL Server and Microsoft Excel was found, thus eliminating the need for additional middleware. The toolset currently consists of 1 main file and 18 separate files for more specialized analysis. The tools total in 361 megabytes in size. They are easily adaptable for more specific purposes when such needs occur.

In unison with the update of time series, the content between IPTJ and reporting sheets were synchronized for the time series of 1990-2016 for all current categories and pollutants. Methods described in this document do not replace or remove any previously existing QA/QC routines, which include procedures described in the EMEP/EEA Guidebooks.

## 1.1 The main tool

The main tool provides means to compile, analyse and correct NFR table files. It is designed to be used in sync with the latest reporting sheets, but is also suitable for performing the same procedures on previously submitted files or submission files of other nations. It also provides means to manage notation keys for the complete time series.

Due to certain formatting solutions of the reporting sheets, the tool first needs to prepare the document for use. It opens merged headers of pollutants for all sheets and removes hidden spaces and row changes of headers and labels in order for built-in lookup-functions to be able to search through the document. The headers can be remerged for all sheets if needed. These features are included in the user interface (UI).

### 2.1.1 Time series from reporting sheets

The tool is best suitable for the analysis of time series per pollutant. The expert can either use the UI-solutions to select a category and a pollutant to investigate, or press a quick key on cell selection within the reporting sheet to retrieve full time series for the selected pollutant and category. Furthermore, the user is able to retrieve all the contributing rows from IPTJ which the reporting sheet value is an aggregate of. The relevant data in its greatest possible detail is therefore continuously accessible by the expert. The emission intensity is visualized with conditional formatting and the following automatic check-ups are made:

- Strongly deviating values



- Gaps in series
- Inconsistency in notation keys
- Sudden drops or increases in emissions.
- Linear estimates for missing values (feature not used in inventory)

The following diagram explains the compilation of time series from the NFR reporting sheet. User selects a cell and with a quick key the time series for the corresponding pollutant and category is collected. A graphical plotting is also automatically generated. The following examples are for demonstration purposes only and cover only the years 1980-1996. Some artificial errors are also included in order to present examples of the check-ups.

1A1a	NOx	Notes
1A1a	NOx	
...	:	
...	24,718	
1980	129,228	The value deviates over 100 % from the series median.
1981	109,120	
1982	104,120	
1983	93,436	
1984	88,553	
1985		Gap in series. Linear estimation: 96,5075
1986	104,462	
1987	112,601	
1988	113,043	
1989	116,964	
1990	59,539	A drop of 49,1 % in emission levels. Check continuity.
1991	58,921	
1992	47,001	
1993	51,560	
1994	51,819	
1995	39,101	Possibly erroneous value in set.
1996	46,389	
...	...	

The expert can also loop the procedure over all pollutants and create a compilation table of all pollutants for the selected category (NFR category or national totals). Now the remarks of the selected series is stored as comments and marked with a red font. Relative standard deviation is calculated and an index value is calculated to estimate the reliability of the series. The index does not exclude values that are truthfully deviating or missing, thus automatic corrections can not be performed and an expert estimation is always needed for values that demand attention. Any changes in values or notation keys can be immediately exported back to the reporting sheet.

**Table 1 – Example of a time series compilation table after looping through all pollutants. Pollutants expand horizontally and years vertically.**

NATIONAL TOTAL	NOx (as NO2)	NMVOC	SOx (as SO2)	NH3	PM2.5	PM10	TSP	BC	CO	...
1980	303,825	NE	583,828	34,272	NE	NE	NE	NE	NE	...
1981	283,975	NE	533,830	34,759	NE	NE	NE	NE	NE	...
1982	279,406	NE	483,828	35,334	NE	NE	NE	NE	NE	...
1983	270,513	NE	371,831	35,522	NE	NE	NE	NE	NE	...
1984	266,352	NE	367,830	35,619	NE	NE	IE	NE	NE	...
1985	284,028	NE	381,832	35,636	NE	NE	NE	NE	NE	...
1986	285,889	NE	330,831	35,348	NE	NE	NE	NE	NE	...
1987	297,204	229,852	327,834	34,630	NE	NE	NE	NE	NE	...
1988	302,181	264,123	301,838	33,998	NE	NE	NE	NE	NE	...
1989	310,009	258,209	243,844	12,022	NE	NE	NE	NE	NE	...
1990	305,629	233,472	248,544	33,630	48,366	72,694	98,952	10,212	720,735	...
1991	NA	219,563	205,275	31,641	43,445	65,150	85,630	9,708	688,077	...
1992	275,374	214,625	155,967	30,767	39,899	59,213	77,930	9,441	667,862	...
1993	277,728	207,533	137,396	31,167	37,033	55,526	72,983	9,225	654,655	...
1994	277,596	205,741	122,529	32,106	36,375	54,637	72,888	9,105	636,460	...
1995	258,139	200,357	104,442	32,417	34,726	51,327	68,062	8,859	629,857	...
1996	262,178	193,999	108,994	33,432	33,842	49,945	65,863	8,577	620,323	...
:	:	:	:	:	:	:	:	:	:	...
RSD (%)	22,2 %	31,4 %	86,4 %	4,8 %	24,3 %	21,5 %	19,3 %	23,4 %	24,2 %	...
Reliability index	9,3	12,9	34,5	2,0	10,0	8,8	7,9	9,8	10,2	...

### 2.1.2 Notation key management

The compilation table is especially suitable for notation key management, as all data can be imported and exported back with one click. The main tool allows notation key management in many different ways:

- Directly in the NFR sheet
  - The notation key of the selected cell can be multiplied for all years or a prompted range of years with dedicated quick keys.
- In the compilation table
  - The compilation table makes it easy to spot and correct inconsistencies in notation keys over the time series. It also enables mass editing of NK's for example when changes in categorization occurs.
- In the time series analyzer
  - data can be modified and exported back to the NFR sheet in this view too.

VBA-assisted lookup functions deliver the modified data always in their corresponding places in the NFR sheet. This reduces the amount of manual labour, as the compiling expert does not need to browse through all sheets to make changes.

### 2.1.3 Compiling sheets for new inventory year

The main tool also allows instant delivery of emission values from IPTJ to the reporting sheet. The expert selects the current inventory year, and emission values are retrieved directly from the database using an SQL-assisted PowerPivot-query. The resulting table takes identical from as the reporting sheets. Missing

values or notation keys are then retrieved from the corresponding year of the previously prompted and selected NFR submission file. Also activity data is added.

**NFR Compilation Tool**

Notation keys from:  Search

Emission data from:  Refresh

Year:  Get Get only notation keys

**NFR reporting table for the year 2016**

				NOx (as NO2)	NMVOC	SOx (as SO2)	NH3	PM2.5	PM10	TSP
				kt	kt	kt	kt	kt	kt	kt
A_PublicP	1A1a	Public electricity and heat	Notes	24,7179	1,28642514	15,29805415	0,00204	0,4230907	1,34419	2,751775
B_Industry	1A1b	Petroleum refining		2,29086	0,07532931	6,624842053	NA	0,0492414	0,19532	0,599843
B_Industry	1A1c	Manufacture of solid fuels		NO	NO	NO	NO	NO	NO	NO
B_Industry	1A2a	Stationary combustion in m		3,29196	0,02098773	0,507260175	NA	0,0077297	0,01928	0,032169
B_Industry	1A2b	Stationary combustion in m		0,13465	0,00120449	3,047155399	NA	0,0050221	0,00905	0,025419
B_Industry	1A2c	Stationary combustion in m		1,32835	0,00527129	1,048827139	NA	0,0569474	0,08979	0,106027
B_Industry	1A2d	Stationary combustion in m		17,4456	0,33813159	2,987894905	NA	1,3304282	1,83229	2,120437
B_Industry	1A2e	Stationary combustion in m		0,46131	0,02781427	0,550384247	NA	0,0158448	0,03089	0,054813
B_Industry	1A2f	Stationary combustion in m		1,79973	0,01014703	1,150361177	NA	0,1561773	0,35173	0,823165
L_Offroad	1A2gvii	Mobile Combustion in man		5,80202	1,10432859	0,002794853	0,002308	0,3338679	0,33387	0,333868
B_Industry	1A2gviii	Stationary combustion in m		2,03601	0,21440349	0,671799578	0,001	0,0933998	0,25128	0,583707
H_Aviation	1A3-iii	International aviation L TO		0,67972	0,10064708	0,041193749	NA	0,0050216	0,00502	0,005022

**Figure 1 - A screenshot of the NFR compilation tool**

The compilation tool performs checks and compares data and labels the cell with individual colors when:

- Emission value is  $x$  % higher than in previous year\*
- Emission value is  $x$  % less than in previous year\*
- If a BC > PM2.5 > PM10 > TSP
- Sum of PAH's doesn't equal to Total 1-4,
- Emission value is 10 times higher, or a value is missing where previously reported
- Zero values
- Values where IPTJ content is newer than in the reporting sheet

\*The tolerance  $x$  for comparison is user adjustable.

The retrieval of complete time series and corresponding IPTJ rows is also available by cell selection analogously to when applied to the NFR sheet. The expert can therefore always track the data to more exact levels of detail. The data collected by the compilation tool can be exported to the reporting sheet with a one click solution. It is also possible to roll through all years in order to keep IPTJ content always in unison with reporting sheets. This eliminates the need to compile reporting sheets manually.

## 1.2 Tools for data analysis, compilation and management

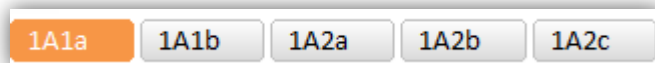
To expand the scope of investigation limited by the main tool, several more specified tools were constructed by using the same technologies and disciplines to reveal issues of more specific types and levels of detail. These tools include:

- Time series analysis at six different levels of detail:
  - Point level (a facility can have multiple points)
  - Facility level (a SNAP category typically consists of multiple facilities)
  - SNAP categorization (SNAP category is usually a subset of an NFR category)
  - NFR categorization
  - By fuel types
  - Total emissions
- Tool to sort all point sources with highest contribution to overall emissions
- Tool to investigate key sources per pollutant
- A query to calculate implied emission factors
- A query to investigate the consistency of categories between different sources
- NULL-finder to reveal rows with missing essential information, such as emission values or categorizations.
- A query to find duplicate rows
- A query to manually back-up the main results table before major changes
- A routine to reveal point level gaps in time series and to estimate the combined effect of them.

All of the tools above connect to IPTJ and are able to utilize the latest inventory data. The following sub-chapters describe the tools in greater detail. The methodology for point level gap search is described in a separate documentation.

#### 2.1.4 Common techniques and control elements

The tools connect to IPTJ via an ODBC connection and they utilize a combination techniques native to Microsoft Excel, PowerPivot and SQL. In some cases the tools are enhanced with VBA. By using PowerPivot for data retrieval, the upper limit of rows rarely becomes an issue in data management. A typical control element is PivotTable slicer where user can select one or more categories, pollutants on years depending on the tool. Multiple selections are allowed by pressing control-button while selecting. This way the expert can compile more defined datasets for various purposes.

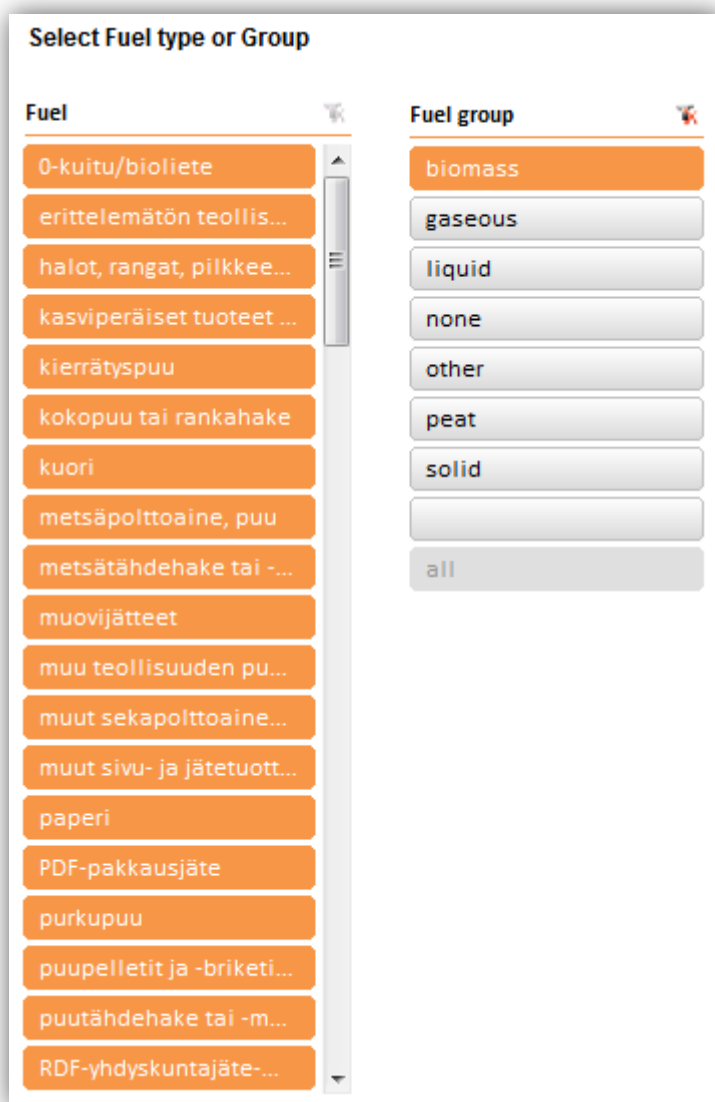


**Figure 2 - A control element for NFR selection**

The resulting tables usually possess the following structures and features:

- Dimensionality of the table consisting of two of the following: *pollutant*, *year* and *category*. The remaining dimension will remain as a control element.
- Conditional formatting to visualize relative differences in e.g. emission intensity.
- Relative standard deviation is calculated for time series

The tool might also contain multiple control elements, as is with the tool grouping time series by fuels. The selections are allowed in two different levels of detail and selections can be made independently of each other.



**Figure 3 - Example of multiple control elements in time series by fuel. Detailed fuel labels are currently available only in Finnish language.**

### 2.1.5 Time series analysis at point level

The tool compiles a table by dimensions of *year x pollutant* after selecting a point ID or a set of points. As opposed to previous systems, the name and description of the point is displayed by default. This aids in understanding the nature of the activity or process of the selected point.

Only years with emissions are displayed. Pollutants are all displayed regardless of whether the selected point has emissions for the given pollutant or not. The tool alerts on years that are completely missing and when the maximum emission value deviates over ten times from the series median for any pollutant. The results are enhanced with conditional formatting to highlight the relative differences in emission values. Gaps in emission values are also displayed per pollutant.

**Table 2 – Example of time series by point result sheet. Pollutants expand horizontally and years vertically.**

RSD (%)	14,3 %	14,4 %	26,3 %	NA	...
---------	--------	--------	--------	----	-----

Year	NOx as NO2	NMVOC	SOx as SO2	NH3	...
1990	58,828	4,54E-01	76,066		...
1991	58,760	4,29E-01	68,817		...
1992	46,651	4,12E-01	49,151		...
1993	51,175		49,486		...
1994	51,530	5,25E-01	46,905		...
1995	38,855	5,38E-01	36,616		...
1996	46,157	6,13E-01	45,303		...
⋮	⋮	⋮	⋮	⋮	...

#### 2.1.6 Time series analysis at facility level

The expert selects a pollutant to investigate. This forms a table with the dimensions of *facility x year*. The tool groups all point sources (e.g. individual boilers) into their corresponding facilities. The processes are described in the greatest detail possible. The expert can now browse through time series of all facilities and quickly investigate which events (e.g. changes in processes) actually contribute to the varying emission values. It also reveals if a point ID has changed during the time series, thus patching the shortcomings of TS investigation by point ID only. The expert can filter the dataset by NFR category or certain range of years.

#### 2.1.7 Time series by NFR and SNAP

In comparison to NFR categorization SNAP categorization is a more detailed and in IPTJ content in all cases a subset of an NFR category. The tools are identical to each other except by the controls for categorization. The tools flags missing years and if a pollutant maximum value is ten times greater than the series median.

#### 2.1.8 Time series by fuel

The tool compiles time series by either a specific fuel or fuel groups (e.g. liquid fuels) by selecting the desired set from control slicers. These selections can be made independently of each other. Dimensions of the table are *year x pollutant*. Similarly to the previous tool, relative standard deviation for each pollutant is calculated and flagged if the maximum value is ten times greater than the series median.

## 2.1.9 Key source analysis

Categories that contribute to 80 % of emissions per pollutant are considered as key categories. These can be quickly retrieved for all pollutants and years by using control slicers. The table calculates the sector sum, percentage of total emissions and cumulative percentage of emissions in an inclining order. Dataset can be filtered by NFR categories, for example to exclude NFR sheet memo items from key category analysis.

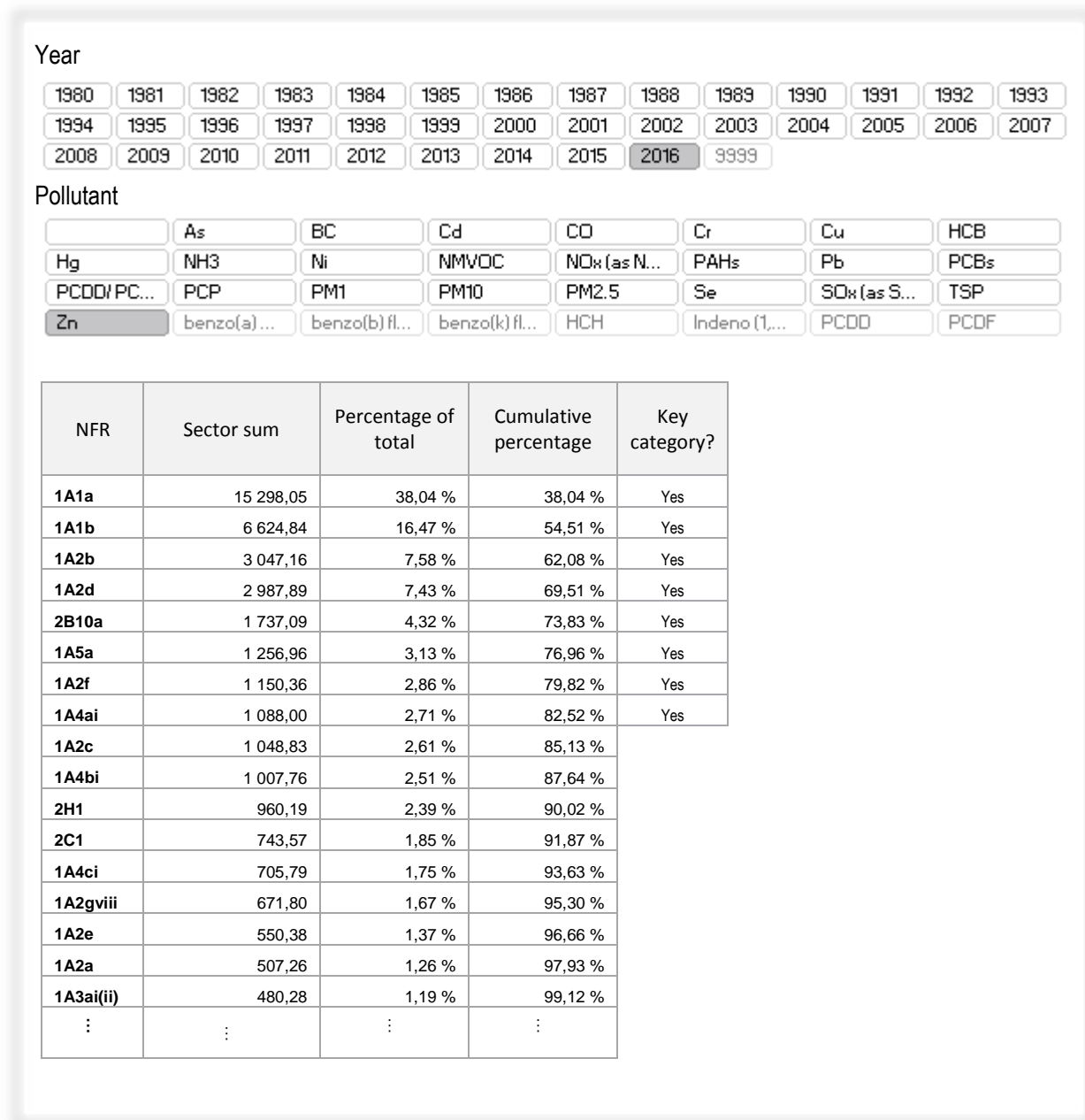


Figure 4 – Example of a view in Key Category Analysis

# Checking gaps and discontinuity in emissions of energy sector point sources

This chapter explains the search of gaps and discontinuities in the energy sector emission data that was carried out during the time series update of 2017 and 2018. Many of the observations described here have since been corrected and are not present in the latest inventories.

## 1.3 Data diminution

By the amount of data, the energy sector is the most intensive of all sectors. It is also complicated by its data structure. The emission data alone consists of 1 810 464 rows in 25 columns, separated into three tables. Microsoft Excel limits the rows at 1 048 576. Therefore the dataset needs slicing or diminution in order to be manageable in Excel-environment.

**Table 3 – Amount of rows in energy sector emission data**

Range	Rows
1990-2004	960768
2005-2012	610920
2013-2015	238776
<b>Total</b>	<b>1810464</b>

By selecting under investigation only rows with actual emissions it is possible to reduce the size of the dataset into 867 916 rows in 4 columns. As of columns, only point source id-value, year, emission value for the corresponding year, and pollutant are selected. The query sorts the data for to be suitable for further analysis: first by point ID, then by pollutant and last by year, resulting in comprehensible time-series for points, as illustrated in table below.

**Table 4 – A extracted part of annual emissions for one point and pollutant.**

Point ID	Emission	Year	Pollutant (ID)
12121	0,3402	2005	24
12121	0,335016	2006	24
12121	0,276	2007	24
12121	0,21744	2008	24
12121	0,231667	2009	24
12121	0,105206	2010	24
12121	0,03562	2011	24

## 1.4 Search of discontinuities

The routine checks for gaps in time-series where the following conditions are met:

- a point has more than one entry in time series per pollutant
- missing value exist in a range between two existing values (i.e. if a missing value exists in the beginning or the end of the series, it will not be revealed)
- Series connects the same point and pollutant

The routine also marks the last known values before and ahead of the found gap. A gap can therefore consist of more than one year, and the duration of the gap is recorded.



The check-up formula translates as follows:

If  $y_i \neq y_{i-1} + 1$ , then print for the row  $i$ : "the values for the years  $y_{i-1} + 1 - y_i - 1$  missing"

where,

$i$  = row index

$y$  = year

$y_{i-1}$  = year of the previous row

$y_i - 1$  = actual previous year

If the previous condition is met, the start point of the gap is filled to the cell  $y_{i-1}$ . The print out of found gap simultaneously marks the end point of the gap. These remarks can be used when referencing data in further investigations.

**Table 5 – A schematical example of the printouts for a point with missing values**

Point ID	Emission	Year	Pollutant (ID)	Printout
12121	0,3402	2003	24	<i>First in series (not checked)</i>
12121	0,335016	2004	24	
12121	0,3402	2005	24	
12121	0,335016	2006	24	Start point of a gap
12121	0,276	2009	24	The values for the years 2007-2008 missing
12121	0,21744	2010	24	
12121	0,1052062	2011	24	
12121	0,03562	2012	24	<i>Last in series (not checked)</i>

### 2.1.10 Results

The method was able to programmatically reveal 518 gaps in series which would contribute to 0.06 % in relation to the count of rows examined. The method does not disclose the reason for the missing value. Many or most of these might be valid gaps due to e.g. stoppage of the plant. The table below presents for selected pollutants the expectable maximum of possible emissions if the gaps would be filled with the value of the closest year. The overall sums are negligible.

**Table 6 – Count of found gaps and their theoretical estimation of "missing" emissions in relation the overall emissions**

Pollutant	Pollutant ID	Estimate of sum of missing emissions*	Percent in relation to pollutant total	Count of missing values
As (kg)	8	0,270	0,001 %	17
Cd (kg)	20	0,660	0,004 %	17
CO (t)	24	63,690	0,006 %	28
Cr (kg)	31	4,541	0,001 %	17
Cu (kg)	35	6,689	0,004 %	18
Hg (kg)	47	0,066	0,001 %	17
Ni (kg)	63	25,114	0,009 %	17
Pb (kg)	79	7,496	0,002 %	17
SOx (as SO2) (t)	97	24,012	0,002 %	22
Zn (kg)	112	90,257	0,009 %	18
NOx (as NO2) (t)	314	31,279	0,002 %	28
PCDD/ PCDF (t)	1043	0,003	0,004 %	27
TSP (t)	1047	29,808	0,010 %	30
NMVOC (t)	1064	2,572	0,008 %	28
PAHs (g)	1065	574,868	0,008 %	32

PM10 (t)	1091	10,455	0,006 %	30
PM2.5 (t)	2591	3,817	0,004 %	30

## 1.5 Visual analysis of systematic coherence

By pivoting the data into a table by year and pollutant, it is possible to evaluate systematic anomalies visually. The example image below compiles the annual average margin to the rightmost column. Likewise the average margin by pollutant is compiled to the bottom row. Excel built-in conditional formatting can be used to enhance the visual interpretation of the values, which can further aid in revealing the hotspots of gaps. Visual interpretation suggests the following:

- Years 1992, 1998 and 2013 are slightly more inconsistent than other years. In contrast, the years 1995, 2005 and 2006 are more consistent. The years 1990 and 2015 appear consistent due to methodological reasons: the start and end points of time series cannot be analyzed. For all known points the maximum temporal range in the dataset is between the years 1990-2015.
- As of pollutants, nickel (Ni), zinc (Zn) carbon monoxide (CO), and particles (TSP, PM10, PM2.5) appear slightly more inconsistent. In contrast, Sulphur oxides (SOx) seem particularly consistent for the whole time series, except for the year 2012.
- The notable hotspots in series are in:
  - 1992: Cd, Co, Zn, TSP, NMVOC, PAH, PM10 and PM2.5
  - 1998: Zn, TSP, PAH and PM10
  - 2012: Ni
  - 2013: Zn, NMVOC

**Table 7 - Overview of visual analysis. Green represents low relative share of possibly missing values in contrast to the overall emissions of a given year and pollutant. Red represents higher share. All of the shares are relatively low and the scale of formatting is selected only to emphasize differences within.**

Year / Pollutant	As (kg)	Cd (kg)	CO (t)	Cr (kg)	Cu (kg)	Hg (kg)	Ni (kg)	Pb (kg)	SO2 (as SO2) (t)	Zn (kg)	NOx (as NO2) (t)	PCDD/PCDF (t)	TSP (t)	NMVOC (t)	PAHs (g)	PM10 (t)	PM2.5 (t)	Annual average
1990	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
1991	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,001 %	0,000 %	0,000 %	0,001 %	0,010 %	0,000 %	0,000 %	0,001 %
1992	0,004 %	0,062 %	0,089 %	0,016 %	0,049 %	0,012 %	0,035 %	0,022 %	0,002 %	0,132 %	0,016 %	0,065 %	0,130 %	0,073 %	0,090 %	0,063 %	0,036 %	0,052 %
1993	0,001 %	0,001 %	0,001 %	0,000 %	0,001 %	0,000 %	0,026 %	0,003 %	0,000 %	0,001 %	0,004 %	0,000 %	0,011 %	0,003 %	0,024 %	0,014 %	0,017 %	0,006 %
1994	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,002 %	0,000 %	0,000 %	0,000 %
1995	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
1996	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
1997	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,010 %	0,001 %	0,006 %	0,000 %	0,001 %	0,000 %	0,003 %	0,001 %	0,007 %	0,004 %	0,006 %	0,002 %
1998	0,001 %	0,017 %	0,018 %	0,006 %	0,019 %	0,003 %	0,011 %	0,007 %	0,007 %	0,049 %	0,004 %	0,011 %	0,033 %	0,017 %	0,018 %	0,015 %	0,009 %	0,015 %
1999	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
2000	0,001 %	0,001 %	0,001 %	0,000 %	0,001 %	0,000 %	0,021 %	0,002 %	0,000 %	0,001 %	0,002 %	0,000 %	0,000 %	0,002 %	0,000 %	0,000 %	0,000 %	0,002 %
2001	0,001 %	0,001 %	0,001 %	0,000 %	0,001 %	0,000 %	0,021 %	0,002 %	0,000 %	0,001 %	0,002 %	0,000 %	0,000 %	0,002 %	0,001 %	0,000 %	0,000 %	0,002 %
2002	0,000 %	0,000 %	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,001 %	0,000 %	0,000 %	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %
2003	0,000 %	0,001 %	0,001 %	0,000 %	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %	0,002 %	0,001 %	0,000 %	0,000 %	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %
2004	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,001 %	0,000 %	0,000 %	0,000 %
2005	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
2006	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
2007	0,000 %	0,000 %	0,002 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,007 %	0,001 %	0,000 %	0,009 %	0,001 %	0,000 %	0,000 %	0,001 %
2008	0,000 %	0,001 %	0,001 %	0,000 %	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %	0,002 %	0,000 %	0,000 %	0,001 %	0,003 %	0,000 %	0,000 %	0,000 %	0,001 %
2009	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
2010	0,000 %	0,006 %	0,006 %	0,003 %	0,006 %	0,001 %	0,002 %	0,002 %	0,000 %	0,015 %	0,001 %	0,003 %	0,011 %	0,025 %	0,004 %	0,004 %	0,002 %	0,005 %
2011	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,021 %	0,002 %	0,007 %	0,000 %	0,001 %	0,000 %	0,005 %	0,001 %	0,006 %	0,007 %	0,009 %	0,004 %
2012	0,002 %	0,001 %	0,001 %	0,000 %	0,001 %	0,000 %	0,053 %	0,004 %	0,018 %	0,001 %	0,003 %	0,000 %	0,012 %	0,001 %	0,011 %	0,016 %	0,019 %	0,008 %
2013	0,001 %	0,012 %	0,013 %	0,006 %	0,014 %	0,002 %	0,004 %	0,005 %	0,005 %	0,028 %	0,002 %	0,007 %	0,024 %	0,060 %	0,008 %	0,010 %	0,004 %	0,012 %
2014	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,001 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
2015	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %	0,000 %
Pollutant average	0,001 %	0,004 %	0,006 %	0,001 %	0,004 %	0,001 %	0,009 %	0,002 %	0,002 %	0,009 %	0,002 %	0,004 %	0,010 %	0,008 %	0,008 %	0,006 %	0,004 %	0,005 %

## 1.6 Interpretation of results

Out of the combined set of nearly two million rows of emission data, 518 meaningful events of discontinuity were observed. In relation to the whole dataset, the time series for the pollutants and points under investigation is 99,97 % complete, and a notable share of the remaining 0,03 % might be explained by valid reasons. As the series is subject to annual changes in practically all of its parameters and is prone to technical and human error, this analysis suggests extremely high level of consistency and accuracy in data compilation and management. The calculation of energy sector emission data seems very consistent, precise and trustworthy. The emission values that might be lost due to accidental or erroneous gaps in dataset are negligible. However, as the points of discontinuity are known, they could be checked for example in the order of declining magnitude of emissions.

**Table 8 – Overall emissions of the points in the scope of this investigation summed up by year and pollutant.**

Pollutant (unit)	As (kg)	Cd (kg)	CO (t)	Cr (kg)	Cu (kg)	Hg (kg)	Ni (kg)	Pb (kg)	SO <sub>2</sub> (as SO <sub>2</sub> ) (t)	Zn (kg)	NO <sub>x</sub> (as NO <sub>2</sub> ) (t)	PCDD/PCDF (t)	TSP (t)	NMVOC (t)	PAHs (g)	PM <sub>10</sub> (t)	PM <sub>2.5</sub> (t)
1990	5241,9	945,5	54693,5	30986,8	13538,5	426,7	36591,5	30150,8	144204,5	72362,3	85142,4	2,8	17519,7	1435,7	376849,2	11391,9	6178,9
1991	3802,4	722,4	49053,8	20810,5	9645,6	391,6	27537,2	21652,2	123643,9	52566,2	83941,8	2,7	15770,9	1327,2	338021,4	10694,1	5954,1
1992	3162,3	651,6	45649,4	17878,5	8389,5	349,1	24752,6	18933,5	101964,6	46184,5	77923,1	2,6	13484,1	1134,1	338708,3	8691,1	4685,1
1993	2859,1	653,2	49807,9	16274,2	7644,5	393,4	23553,5	18108,9	91694,8	41429,4	82704,2	2,9	13753,7	1227,5	367866,7	9207,3	4957,2
1994	2643,1	653,5	50548,9	14248,2	7242,3	425,8	23018,1	16848,9	86497,2	42179,1	88229,0	3,4	15035,6	1503,8	410429,9	10013,2	5288,6
1995	2427,2	608,3	53284,3	12943,8	6608,9	394,4	21073,6	15630,5	78756,1	37258,1	83361,4	3,4	13716,7	1313,1	410795,8	9435,4	5113,3
1996	2319,9	554,7	50169,6	11359,9	5833,5	439,3	20153,3	14361,8	87909,8	30545,5	93280,7	3,7	13306,6	1248,6	422434,4	9603,7	5201,5
1997	1892,5	552,2	56664,4	8466,6	4748,2	430,4	16089,2	12666,6	80923,9	26133,1	91490,6	3,8	13413,3	1309,5	437048,8	9794,4	5443,6
1998	2146,0	595,5	57789,3	11147,2	5532,5	391,5	18727,3	14771,0	72222,5	28999,3	85332,4	3,7	13300,6	1263,8	451796,8	9476,5	5352,8
1999	2018,0	611,2	60799,3	10572,0	5207,7	389,8	18132,0	14609,7	71646,7	28326,4	82603,0	3,7	13321,7	1286,3	466085,5	9526,3	5417,8
2000	1880,9	601,0	60763,3	10128,5	4869,4	374,6	16895,9	14104,6	67738,5	27256,2	80455,8	3,7	13180,0	1295,5	458801,0	9388,1	5349,5
2001	1949,0	572,4	57676,2	10361,4	5091,8	408,0	17632,3	13845,5	73980,0	27926,4	92518,6	4,2	13284,8	1373,3	481914,9	9379,7	5156,4
2002	2070,5	617,9	59317,1	11015,2	5320,6	441,6	18226,1	14859,7	79321,5	29078,8	98003,1	4,2	13959,7	1435,3	473604,7	9855,9	5428,4
2003	2209,0	643,8	61235,7	10898,7	5793,7	514,9	18473,7	14931,2	95133,0	33912,5	113615,2	4,8	15222,8	1678,2	514094,1	10610,5	5617,2
2004	2200,8	667,3	63515,4	11275,0	5799,5	487,0	17070,3	15459,3	81993,9	33285,8	103959,3	4,7	15036,8	1573,3	497984,3	10467,2	5601,6
2005	1998,8	634,6	60111,6	10916,6	5521,2	360,0	16255,4	14883,2	64598,9	31332,1	82221,3	3,8	13317,8	1396,1	450513,0	8910,7	4927,0
2006	2239,2	778,2	73122,9	11390,3	6660,7	504,1	16922,5	16483,6	85412,1	44487,0	109461,8	5,0	18320,0	1789,7	544426,8	11412,1	5849,5
2007	2248,1	701,6	63039,3	11431,3	6143,3	475,3	16036,7	16047,9	80066,9	34479,6	100686,9	4,6	15017,7	1614,7	484027,4	10187,9	5443,1
2008	2266,0	703,9	61327,7	11974,0	6516,8	402,7	15576,6	16223,7	67067,4	36915,7	89290,0	4,4	14749,4	1546,9	511579,7	9670,1	5225,9
2009	2090,7	589,9	50354,5	10082,4	6092,1	376,0	14254,6	13616,4	64322,4	34059,4	82640,6	4,3	13091,2	1441,4	488606,4	8592,5	4451,1
2010	2257,0	691,7	58689,8	10855,6	6571,4	458,8	15177,5	15346,5	74771,1	38566,8	98855,3	5,1	15416,0	1632,8	561810,0	10230,1	5271,7
2011	2199,3	689,7	59363,9	11009,8	6505,0	406,6	14067,9	15270,5	64211,7	38922,0	87041,7	4,8	14666,1	1511,1	538351,4	9499,4	4950,7
2012	1939,6	695,9	55470,4	9835,5	6146,7	356,0	12687,5	14493,9	54528,6	39470,1	83993,5	4,9	14188,7	1547,6	586794,6	9121,0	4868,2
2013	1986,5	744,7	55154,3	10838,0	6466,5	385,2	12076,8	15353,9	55975,4	43713,2	79923,2	5,4	14790,1	1464,2	645460,3	9337,6	4844,9
2014	1833,5	726,1	54132,8	9726,9	6078,5	362,5	11198,6	14556,4	53554,7	41461,8	74635,1	5,7	14350,2	1412,9	712564,1	9046,6	4753,2
2015	1648,6	718,4	51431,3	8636,3	5770,2	329,4	10171,1	13730,6	48159,4	41573,6	68043,6	5,9	13939,1	1387,8	776684,7	8703,8	4653,4

**Table 9 – The relative share of emissions from filling the found gaps with the value of the closest year (with a false assumption of observed gaps being all erroneous)**

Year / Pollutant	As (kg)	Cd (kg)	CO (t)	Cr (kg)	Cu (kg)	Hg (kg)	Ni (kg)	Pb (kg)	SO2 (as SO2) (t)	Zn (kg)	NOx (as NO2) (t)	PCDD/PCDF (t)	TSP (t)	NM VOC (t)	PAHs (g)	PM10 (t)	PM2.5 (t)	Annual average	
1990	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%
1991	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	1%	%	%	%	%	1%
1992	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,0	0,0	0,1	0,07	0,0	0,0	0,0	0,0	0,05
	%	62%	89%	16%	49%	12%	35%	22%	02%	22%	16%	65%	30%	3%	90%	63%	36%	%	2%
1993	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	3%	%	%	%	%	6%
1994	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%
1995	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%
1996	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%
1997	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	1%	%	%	%	%	2%
1998	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,01
	%	17%	18%	06%	19%	03%	11%	07%	07%	49%	04%	11%	33%	0,01	7%	18%	15%	09%	5%
1999	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%
2000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	2%	%	%	%	%	2%
2001	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	2%	%	%	%	%	2%
2002	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	1%	%	%	%	%	0%
2003	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	1%	%	%	%	%	0%
2004	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%
2005	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%
2006	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%
2007	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	02%	%	%	%	%	%	%	%	07%	01%	00%	0,00	9%	01%	00%	00%	1%
2008	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	3%	%	%	%	%	1%
2009	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00
	%	%	%	%	%	%	%	%	%	%	%	%	%	0%	%	%	%	%	0%

<b>2010</b>	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	<b>0,00</b> <b>5 %</b>
	00	06	06	03	06	01	02	02	00	15	01	03	11	0,02	04	04	04	02	
<b>2011</b>	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	<b>0,00</b> <b>4 %</b>
	01	00	00	00	00	00	00	21	02	07	00	01	00	05	0,00	06	07	09	
<b>2012</b>	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	<b>0,00</b> <b>8 %</b>
	02	01	01	00	01	00	0,0	53	04	18	01	03	00	12	0,00	11	16	19	
<b>2013</b>	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	<b>0,01</b> <b>2 %</b>
	01	12	13	06	14	02	04	05	05	28	02	07	24	0,06	08	10	04	04	
<b>2014</b>	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	<b>0,00</b> <b>0 %</b>
	00	00	00	00	00	00	01	00	00	00	00	00	00	0,00	00	00	00	00	
<b>2015</b>	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	<b>0,00</b> <b>0 %</b>
	00	00	00	00	00	00	00	00	00	00	00	00	00	0,00	00	00	00	00	
<b>Pollutant average</b>	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,00	0,0	0,0	0,0	0,0	<b>0,00</b> <b>5 %</b>
	01	04	06	01	04	01	09	02	02	09	02	04	10	8 %	08	06	04	04	

## **Annex 7**

### **Uncertainty Analysis**

## Uncertainty Analysis

- 1.1 Methodology
- 1.2 Uncertainty of the trend
- 1.3 Point source data reported by the plants
- 1.4 Uncertainties in emission data calculated in the emission inventory data system
- 1.5 Activity data uncertainties
- 1.6 Uncertainties in emission factors
- 1.7 QC and planned improvements in uncertainty estimation
- 1.8 Uncertainties by pollutants
- 1.9 References



## 1.1 Methodology

Changes in chapter	
May 2018	KS, TF

The uncertainty analysis for emission data is carried out at NFR subcategory 3 level for the actual emission sources. The method is Monte Carlo simulation (Tier 2) using @Risk software. The uncertainties of the input parameters are estimated by experts compiling the inventories and those of the measured emissions by the competent authorities that supervise emission monitoring carried out at the individual plants. The emissions of some pollutants from certain sources are poorly understood, for instance some POP compounds from fuel combustion and industrial processes, and therefore estimation of their uncertainty is found to be very challenging at the moment.

The uncertainty analysis covers all emission sources included in the inventory and represents thus the uncertainty of the reported emission data. The possible lack of completeness of emission sources is, however, not reflected in the uncertainty analysis. Information of the completeness of the inventory is presented in Chapter 2.8.

The uncertainty analysis is carried out at the country-level, i.e. uncertainties in emissions by region are not assessed.

Uncertainties are expressed as bounds of 95% confidence interval as percent relative to the mean value as recommended in the GPG.

In this uncertainty analysis, two different types of distributions are used. These are

- Normal distribution, which is used in case uncertainties are symmetrical and  $<\pm 100\%$ .
- Beta distribution, which are used in case uncertainty is asymmetric, because the upper boundary exceeded 100% (positively skewed Beta distribution)

In cases where positively skewed Beta distribution was used, the uncertainty was high the upper boundary ( $>100\%$  and up to 1000%) lower boundary close to 0 ( $-100\%$ ) and mean significantly closer to the lower boundary than the higher one. The distribution function that fitted all these conditions was found to be Beta distribution (@Risk function RiskBetaGeneral) with parameters as specified below:

Alpha1=1 (this shape parameter was kept constant)  
Alpha2 defined using mean, Alpha1 and min and max  
Min=0  
Max=upper boundary.

This distribution type was used for all positively skewed uncertainties. Examples of a RiskBetaGeneral functions are presented below in Figures 2.10 for a cases where the upper bound of uncertainty is +1000% and +120%, respectively. The distribution function is inside Excel's If-function (the user language is Finnish; JOS means IF).

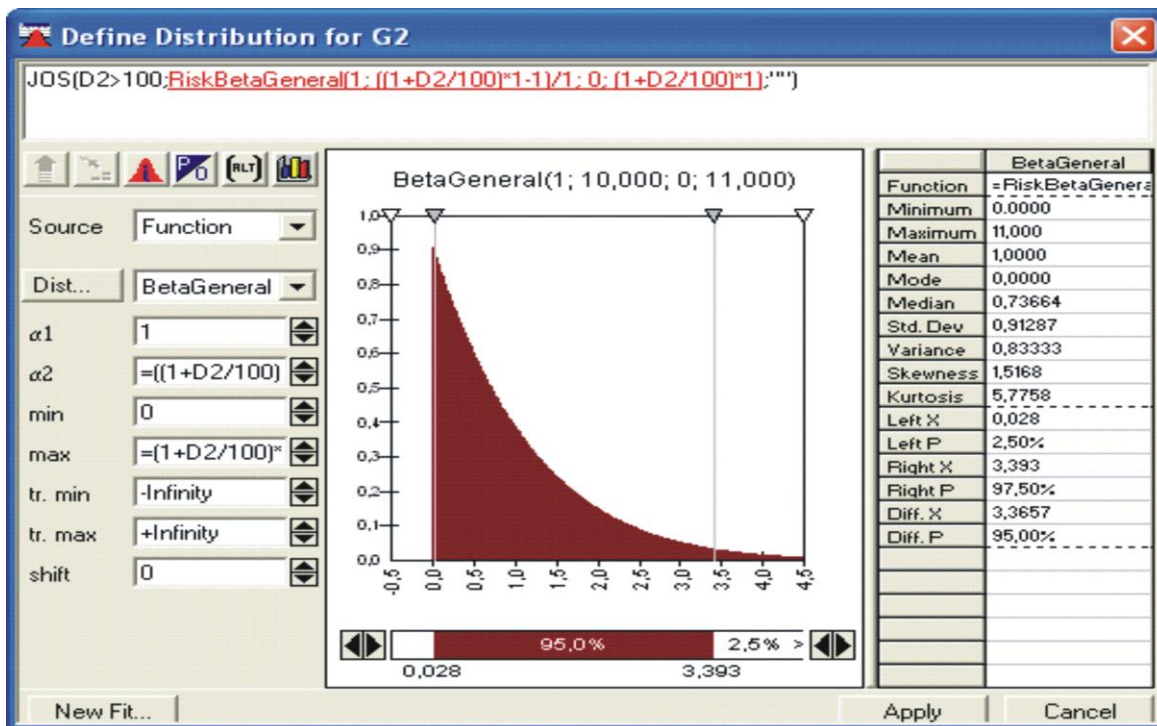


Figure 2.10. An example of the applied beta distribution. The function used can be seen on the top of the picture (JOS = IF in Finnish and cell D2 contains the uncertainty percentage).

The appropriate aggregation of data for the uncertainty analysis is important to avoid over- or underestimation of uncertainty due to correlations. The following assumptions are used in the aggregation level:

- Point source data reported by the plants: emission estimates reported by the operators are considered to be independent. Therefore, uncertainties have been applied separately to the emission estimates of each plant.
- Calculated emissions: Before calculation of uncertainty, those emission sources (e.g. point sources) having the same emission factor were grouped together, and the same uncertainty was applied to the whole group. This reflects the situation that the emission factor uncertainties are correlated across, for instance, different plants. This may overestimate uncertainty when the same emission factor is used for different plants and the real emissions vary notably between these plants (uncertainties potentially cancelling each others) because there are also other factors than technology and fuel affecting the emissions, such as plant operation.
- Emission factors are considered independent across the different sectors, technologies and fuels. This may underestimate uncertainties in the case the emission factors for different technologies are derived from the same data. It can roughly be assumed that this underestimation cancels potential overestimation presented in previous bullet.
- Emission estimates of different pollutants are considered to be independent.
- Activity data are considered to be independent.
- The fuel use uncertainties are the same Statistics Finland uses in the UC analysis for the Finnish greenhouse gas inventory. Thus the fuels are grouped - and the fuel consumption summed up - using the same grouping as Statistics Finland: Solid, Liquid, Gaseous, Biomass and Other fuels.

## 1.2 Uncertainty of the trend

Changes in chapter	
May 2018	KS, TF

For the purposes of the trend uncertainty analysis, the uncertainty of the base year emissions and the current year are needed. The base year depends on the emission compound as presented in the Table 2.1 below. To ensure comparability between compounds, the uncertainties have been estimated for the year 1990 for all the compounds.

**Table 2.1. Base years for Finland for the pollutants regulated under the UNECE Convention of Long-Range Transboundary Air Pollution.**

Compound	Base year
SO <sub>2</sub>	1980
NO <sub>x</sub>	1987
CO	1980 *
NH <sub>3</sub>	1980 *
NMVOC	1988
HM	1990
TSP	2000 *
POP	1994

\* For CO, NH<sub>3</sub> and TSP there is no Protocol base year but instead the year of

The methodology to be used for calculating the trend uncertainty will follow, when implemented, the assumptions listed below:

- activity data were estimated independent between years
- emission data reported by the plants were estimated independent between years
- emission factors were assumed to correlate between years in case the same emission factors were used, and uncertainties for both years were estimated equal
- emissions which were estimated using completely different system (e.g. emissions for the year 1980) were assumed independent from the latest year estimate
- to simplify the calculation and also due to lack of detailed data, partial correlations were not used

### 1.3 Point source data reported by the plants

Changes in chapter	
May 2018	KS, TF

Emissions of SO<sub>2</sub>, NO<sub>x</sub> and particulate matter (TSP) are generally included in the emission monitoring programmes of the plants. As this emission monitoring data is being supervised by competent authorities, they can be considered highly reliable.

Those plants that fall under the IPPC installation categories (Integrated Pollution Prevention and Control Directive) report also emissions included in the E-PRTR (European Pollutant Release and Transfer Register) pollutant list. Uncertainty of the E-PRTR pollutant data depend on the estimation method used (measured, calculated by national default emission factors or estimated by plant specific engineering calculations). The methods used in quantifying emissions and their uncertainties are not always known.

#### *Sulphur dioxide, nitrogen oxide and particle emissions*

The reporting obligations determined in the environmental permits or monitoring programmes of the plants for SO<sub>2</sub>, NO<sub>x</sub> and TSP stipulate the emission data production methods. The emission data reports are checked and approved by the supervising authorities and can therefore be considered to be the best known data in the inventory. Under NFR 1 around 95%, under NFR 2 and 3 100% and under NFR 5 around 20% of the emissions are reported by the plants.

For small particles, PM<sub>10</sub> and PM<sub>2,5</sub>, an additional uncertainty is caused by the uncertainty of coefficients used for deriving the small particle fractions from TSP values. This uncertainty is taken into account in the Monte Carlo analysis by adding a separate uncertainty percentage into the calculation: 150% for both PM<sub>10</sub> and PM<sub>2,5</sub> in all emission sources. Black carbon fractions are derived from the PM<sub>2,5</sub> values, and therefore yet additional uncertainty of 100% in relation to PM<sub>2,5</sub> is added into the calculation for all black carbon emission sources.

**Table 2.2. Uncertainties in SO<sub>2</sub>, NO<sub>x</sub> and TSP emission data reported by the plants for 1980, 1990 and 2016.**

NFR category	SO <sub>2</sub>			NO <sub>x</sub>			TSP			
	1980	1990	2016	1987	1990	2016	1980	1990	2000	2016
NFR1 >50MW	NA	±10%	±10%	±10%	±10%	±10%	NA	±10%	±10%	±10%
NFR1 <50MW	NA	±15%	±15%	±20%	±20%	±20%	NA	±20%	±20%	±20%
NFR2	NA	±15%	±15%	±20%	±20%	±20%	NA	±20%	±20%	±20%
NFR2H1 TRS	NA	±25%	±25%	-	-	-	-	-	-	-
NFR5C >50MW	NA	±10%	±10%	±10%	±10%	±10%	NA	±10%	±10%	±10%
NFR5C <50MW	NA	±15%	±15%	±20%	±20%	±20%	NA	±20%	±20%	±20%

#### *Carbon monoxide*

Under NFR 1 around 15% and under NFR 2 100% of the emissions are reported by the plants. Detailed reporting rates for the NFR subcategories are presented in Chapter 3.2. CO emissions are generally followed up as an operation control parameter and the emission data reports are checked and approved by the supervising authorities. Therefore plant-specific CO emission data can be considered rather accurate and the uncertainties are estimated to be at ±10% for plants > 50 MW. For smaller plants (<50 MW) the uncertainty is estimated at ±20%. The uncertainties in these emissions are estimated the same for both 1990 and 2016 (Table 2.3).

**Table 2.3. Uncertainties in CO emission data reported by the plants for 1980, 1990 and 2016.**

NFR category	CO		
	1980	1990	2016
NFR 1, >50 MW	NA	10%	±10%
NFR 1, <50MW	NA	±20%	±20%
NFR 2	NA	±20%	±20%
NFR 5C, > 50 MW	NA	±10%	±10%
NFR 5C, < 50 MW	NA	±20%	±20%

### NMVOC

Under NFR 1 around 10% under NFR 2 80%, under NFR 2D3 and 2G around 20% and under NFR 5 around 1% of the emissions are reported by the plants. Detailed reporting rates for the NFR subcategories are presented in Chapter 3.2.

Monitoring of NMVOC emissions is not very often included in the emission monitoring programmes of the plants and therefore the methods used by the plant operators to estimate their NMVOC emissions are not always known. The uncertainties in the NMVOC emission data reported by the plants varies between the different NFR categories depending on whether the emissions are based on direct emission measurements and/or plant specific emission factors or general national emission factors, as is the case in reporting to the EPER register. The NMVOC uncertainties for 1980, 1990 and 2016 are presented in Table 2.4.

**Table 2.4. Uncertainties in NMVOC emission data reported by the plants for 1980, 1990 and 2016.**

NFR category	NMVOC		
	1988	1990	2016
NFR 1	NA	±30%/NA	±30%
NFR 2 (industry)	±100%	±100%	±100%
NFR 2 (solvents)	±100%	±100%	±100%
NFR 5	±30%	±30%	±30%

### Ammonia

NFR 1: Ammonia emission data from combustion of fuels is based on measurements or plant specific emission factors and the uncertainty of these emissions is rather low.

NFR2: Ammonia emissions are based on the monitoring data from the plants but the determination method is unknown.

**Table 2.5. Uncertainties in ammonia emission data reported by the plants for 1980, 1990 and 2016.**

NFR category	NH <sub>3</sub>		
	1980	1990	2016
NFR 1	NA	±30%	±30%
NFR 2	NA	±100%	±100%

## Heavy metals

Operators in the energy production, industry and waste incineration sectors report heavy metals according to their monitoring programmes or under the EPER/PRTR programme. In the metal industry, the emission data is mainly based on plant specific emission factors and the uncertainty for this data can thus be estimated rather low. The percentage of emission data reported by the operators is presented in Chapter 3 in the sub-chapters dedicated to each pollutant.

Uncertainties in the reported mercury emissions are estimated larger than those of other heavy metals because the difficulty in estimation of the emission rate due to the partly gaseous form.

**Table 2.6. Uncertainties in heavy metal emission data reported by the plants for 1990 and 2016**

NFR category	HM		
	1980	1990	2016
NFR 1, other than Hg	NA	±30%	±30%
NFR 2 (industry), other than Hg	NA	±30%	±30%
NFR 2 (solvents)	NA	-100%...120%	-100%...120%
NFR 5C, other than Hg	NA	±30%	±30%
All NFRs, Hg	NA	±50%	±50%

## POP compounds

Monitoring of PCDD/F, PAH-4 and HCB emissions may be included in the monitoring programmes of the plants or the plants report these emissions based on the requirement from the EPER or PRTR programme. At the moment, information of whether these reported data are based on actual measurements/plant specific emission factors or if the operators have calculated the data by the national emission factors, is not clearly recorded into the VAHTI database. Furthermore, measurements of POP emissions contain high uncertainties, especially because the emissions are low.

Percentage of emission data reported by the operators is presented in Chapter 3 in the sub-chapters dedicated to each pollutant.

The estimated uncertainties are -X to +500% for NFR categories 1, 2 and 5 and -X to +600% for NFR categories 2D3 and 2G (solvents).

**Table 2.7. Uncertainties in POP emission data reported by the plants for 1990, 1994 and 2016**

NFR category	PCDD/F	PAH-4	HCB	PCB
NFR 1	-100% to +500%	-100% to +500%	-100% to +500%	-100% to +500%
NFR 2 (industry)	-100% to +500%	-100% to +500%	-100% to +500%	-100% to +500%
NFR (solvents)	-100% to +600%	-100% to +600%	-100% to +600%	-
NFR 5	-100% to +500%	-100% to +500%	-100% to +500%	-100% to +500%

## 1.4 *Uncertainties in emission data calculated in the emission inventory data system*

Changes in chapter	
May 2018	KS, TF

For non-point sources the emission data has been calculated using activity data and emission factors, or, for some activities emission estimates or activity data provided by industrial associations, have been used.

Where emission data for non-point sources is calculated using bulk statistical data, the uncertainty is usually considered much higher than for the point source activity data reported by the plants. However, there are exceptions, such as fuel use statistics in the transport sector, which is considered highly accurate.

For point sources, part of the emission estimates have been calculated using activity data such as fuel consumption, use of products or production data. This data has been obtained directly from the plants or from the authorities.

The differences between the uncertainties of emission factors used for calculation of point source and non-point source emissions are considered smaller than the uncertainties for activity data.

## 1.5 *Activity data uncertainties*

Changes in chapter	
May 2018	KS, TF

Uncertainties in activity data are assumed to depend on the accuracy of reporting by the plants or on the representativeness of statistical data of the activities. The uncertainties of activity data are estimated typically much smaller than those of emission factors. As there are no or few changes in activity data collection, the uncertainty is estimated to be constant for all inventory years.

The uncertainty values used for large point sources and small point sources or non-point sources are estimated as follows:

- For the large installations that have both have the need and ability for accurate record keeping (based on e.g. quality management system requirements) the uncertainties are assumed rather small as presented in Tables 2.8-2.9.
- For smaller facilities and non-point sources the uncertainties are assumed larger as presented in Tables 2.10-2.14.

**Table 2.8. Activity data uncertainties for fuel 2016.**

NFR	Fuel type	Uncertainty 2016	Basis for UC evaluation	
1A	Liquid Fuels	2 or 3 or 5 or 10	Energy balance / expert estimation	
1A	Gaseous Fuels	1 or 2 or 3 or 5 or 10	Energy balance / expert estimation	
1A1	Liquid Fuels	2 or 3 or 5	Expert estimation, Statistics Finland	
1A1	Solid Fuels	1 or 2 or 3 or 5	Expert estimation, Statistics Finland	
1A1	Gaseous Fuels	1 or 2 or 3 or 5 or 10	Expert estimation, Statistics Finland	
1A1	Biomass	10	Expert estimation, Statistics Finland	
1A1	Peat	3 or 15	Expert estimation, Statistics Finland	
1A1	Other Fuels	2	Expert estimation, Statistics Finland	
1A1		15	Expert estimation, Statistics Finland	
1A2	Liquid Fuels	2 or 5 or 10	Expert estimation, Statistics Finland	
1A2	Solid Fuels	5	Expert estimation, Statistics Finland	
1A2	Gaseous Fuels	2 or 3 or 5 or 10	Expert estimation, Statistics Finland	
1A2	Biomass	10 or 15	Expert estimation, Statistics Finland	
1A2	Peat	5	Expert estimation, Statistics Finland	
1A2	Other Fuels	15	Expert estimation, Statistics Finland	
1A3	a. Civil Aviation	Aviation Gasoline and Jet Kerosene	20	Expert estimation, Statistics Finland / Technical Research Centre of Finland
1A3	b. Road Transportation	Gasoline	2	Expert estimation, Statistics Finland / Technical Research Centre of Finland
1A3	b. Road Transportation	Diesel Oil	1	Expert estimation, Statistics Finland / Technical Research Centre of Finland
1A3	b. Road Transportation	Natural Gas	3	Expert estimation, Statistics Finland / Technical Research Centre of Finland
1A3	c. Railways	Liquid Fuels	5	Expert estimation, Statistics Finland / Technical Research Centre of Finland
1A3	d. Navigation	Residual Oil & Gas / Diesel oil	10	Expert estimation, Statistics Finland / Technical Research Centre of Finland
1A3	d. Navigation	Gasoline	20	Expert estimation, Statistics Finland / Technical Research Centre of Finland
1A4	Liquid Fuels	15	Expert estimation, Statistics Finland	
1A4	Solid Fuels	30	Expert estimation, Statistics Finland	
1A4	Gaseous Fuels	30	Expert estimation, Statistics Finland	
1A4	Biomass	20	Expert estimation, Statistics Finland	
1A4	Peat	30	Expert estimation, Statistics Finland	
1A4	Other Fuels	25	Expert estimation, Statistics Finland	
1A5	Liquid Fuels	15	Expert estimation, Statistics Finland	
1A5	Gaseous Fuels	12	Simulated	
1A5	Biomass	20	Expert estimation, Statistics Finland	
1A5	Other Fuels	25	Expert estimation, Statistics Finland	
1A5	Peat	30	Expert estimation, Statistics Finland	

**Table 2.9. Activity data (raw material/production rates) uncertainties for point sources (emissions calculated in the inventory data system) for 1980, 1990 and 2016.**

NFR category	Activity data uncertainty		
	1980's	1990's	2000's
NFR 2	NA	±10%	±10%



**Table 2.10. Activity data uncertainties for fuel consumption in non-point sources (emissions calculated in the inventory data system) for 1980, 1990 and 2016.**

Input	NFR category	Activity data uncertainty 1980's	Activity data uncertainty 1990	Activity data uncertainty 2016
Light Fuel Oil	1A5a	(will be filled in to the next submission)	± 30 %	± 30 %
Natural Gas	1A5a		± 20 %	± 20 %
Wood	1A5a		± 15 %	± 10 %
Liquid Gas	1A5a		± 20 %	± 20 %
Heavy Fuel Oil	1A5a		± 30 %	± 30 %
Sod Peat	1A5a		± 20 %	± 20 %
Industrial Petrol	1A5a		± 20 %	± 20 %
Light Fuel Oil	1A4ai		± 35 %	± 15 %
Natural Gas	1A4ai		± 5 %	± 5 %
Sod Peat	1A4ai		± 25 %	± 30 %
Liquid Gas	1A4ai		± 30 %	± 30 %
Wood	1A4ai		± 20 %	± 20 %
Heavy Fuel Oil	1A4ai		± 30 %	± 15 %
Light Fuel Oil	1A4bi		± 30 %	± 15 %
Black Coal	1A4bi		± 10 %	± 20 %
Natural Gas	1A4bi		± 5 %	± 5 %
Liquid Gas	1A4bi		± 30 %	± 30 %
Sod Peat	1A4bi		± 30 %	± 30 %
Heavy Fuel Oil	1A4bi		± 15 %	± 15 %
Wood	1A4bi		± 20 %	± 20 %
Other fuels	1A4bi		± 25 %	± 25 %
Diesel oil	1A4bi		± 15 %	± 15 %
Motor gasoline	1A4bii		± 15 %	± 15 %
Light Fuel Oil	1A4ci		± 30 %	± 15 %
Natural Gas	1A4ci	± 5 %	± 5 %	
Liquid Gas	1A4ci	± 5 %	± 30 %	
Sod Peat	1A4ci	± 25 %	± 30 %	
Heavy Fuel Oil	1A4ci	± 30 %	± 15 %	
Wood	1A4ci	± 20 %	± 20 %	
Light Fuel Oil	1A4cii	± 15 %	± 15 %	
Industrial Petroleum	1A4cii	± 30 %	± 10 %	
Light Fuel Oil	1A4ciii	± 10 %	± 10 %	
Jet Fuel	1A5b	± 50 %	± 30 %	
Motor Petroleum	1A5b	± 50 %	± 50 %	

**Table 2.11. Activity data uncertainties for transport fuels: non-point emissions calculated in the inventory data system for 1980, 1990 and 2016.**

Input	NFR category	Activity data uncertainty 1980	Activity data uncertainty 1990	Activity data uncertainty 2016
Jet Fuel (aviation)	1A3ai(i)	(will be filled in to the next submission)	± 20 %	± 5 %
Jet Fuel (aviation)	1A3ai(ii)		± 20 %	± 5 %
Jet Fuel (aviation)	1A3aii(i)		± 20 %	± 5 %
Jet Fuel (aviation)	1A3aii(ii)		± 20 %	± 5 %
Aviation Gasoline	1A3aii(i)		± 20 %	± 20 %
Aviation Gasoline	1A3aii(ii)		± 20 %	± 20 %
Motor Petroleum (aviation)	1A3aii(ii)		± 20 %	± 20 %
Diesel Oil (road transport)	1A3bi		± 1 %	± 1 %
Motor Petroleum (road transport)	1A3bi		± 2 %	± 2 %
Natural Gas (road transport)	1A3bi		± 3 %	± 3 %
Diesel Oil (road transport)	1A3bii		± 1 %	± 1 %
Motor Petroleum (road transport)	1A3bii		± 2 %	± 2 %
Natural Gas (road transport)	1A3bii		± 3 %	± 3 %
Diesel Oil (road transport)	1A3biii		± 1 %	± 1 %
Natural Gas (road transport)	1A3biii		± 3 %	± 3 %

Diesel Oil (road transport)	1A3biv		± 1 %	± 1 %
Motor Petroleum (road transport)	1A3biv		± 1 %	± 1 %
Light Fuel Oil (railways)	1A3c		± 5 %	± 2 %
Light Fuel Oil (navigation)	1A3dii		± 10 %	± 15 %
Motor Petroleum (navigation)	1A3dii		± 10 %	± 10 %
Heavy Fuel Oil (navigation)	1A3dii		± 10 %	± 10 %
Light Fuel Oil (off-road)	1A4aii		± 30 %	± 15 %
Liquid Gas (off-road)	1A4aii		± 30 %	± 30 %
Motor petroleum (off-road)	1A4aii		± 5 %	± 5 %
Light Fuel Oil (off-road)	1A2gvii		± 5 %	± 5 %
Motor petroleum (off-road)	1A2gvii		± 30 %	± 5 %
Jet Fuel	1A5b		± 50 %	± 30 %
Motor Petroleum	1A5b		± 50 %	± 50 %

**Table 2.12. Activity data (raw material/production rates) for non-point sources in 1980, 1990 and 2016.**

NFR category	1980	1990	2016
NFR 2	NA	±30%	±30%

**Table 2.13. Activity data uncertainties for livestock population and fertilizer consumption 1980, 1990 and 2016 (Monni et al.i, 2003).**

Input	1980	1990	2016
Livestock population	NA	±5%	±3%
N content in the synthetic fertilisers	NA	±10%	±10%

**Table 2.14. Activity data uncertainties for landfilled waste and wastewater treatment in 1980, 1990 and 2016 (according to Monni et al., 2003 and Monni, 2004).**

Input	1980	1990	2016
NFR 5A landfilled MSW	NA	±30%	±15%
NFR 5A landfilled industrial solid waste	NA	±30%	±15%
NFR 5D, industrial wastewater, COD	NA	±10%	±10%
NFR 5D, domestic wastewater, BOD, densely populated areas	NA	±10%	±10%
NFR 5D, domestic wastewater, BOD, sparsely populated areas	NA	±15%	±15%

For NFR 2 categories the uncertainties are expressed as combined figures including both the emission factor and activity data uncertainties.

## 1.6 Uncertainties in emission factors

Changes in chapter	
May 2018	KS, TF

### **SO<sub>2</sub>, NO<sub>x</sub> and TSP**

The SO<sub>2</sub>, NO<sub>x</sub> and TSP emissions are estimated from technology and fuel specific emission factors.

For those point sources where no SO<sub>2</sub>, NO<sub>x</sub> or TSP emission data is reported by the operators, the emissions are calculated from activity data and emission factors. For point sources, the calculated default emission is always replaced by emission data reported by the operator, if this is available. Only in cases when the operator has not reported emission data for the specific boiler or process, the default data will be used<sup>1</sup>.

<sup>1</sup> The percentages of data reported by the plants and calculated in the inventory data system are presented in Finnish IIR Part 1

The uncertainty in SO<sub>2</sub> emission factors was estimated at ±20% for 2016 and ±30% for 1990 for oil and gas, as sulphur content of these fuels is relatively well known. The uncertainty is estimated somewhat larger, ±40% for coal, peat and biomass.

The uncertainty in NO<sub>x</sub> emissions was estimated ±50% for all emission factors in stationary combustion.

The uncertainty in TSP emissions was estimated larger for combustion of coal, peat and biomass (±60%) for 1A1 and 1A2 than for oil and gas combustion (±50%). The difference in uncertainties between fuels was estimated larger for 1A4 and 1A5: ±50% for oil and gas and ±80% for coal, biomass and peat.

The uncertainty values for emission factors are presented in Table 2.15.

**Table 2.15. Uncertainties in SO<sub>2</sub>, NO<sub>x</sub> and TSP emission factors (EF) in calculation of point and diffuse source emissions for 1990 and 2016.**

NFR category	SO <sub>2</sub> Uncertainty			NO <sub>x</sub> Uncertainty			TSP Uncertainty			
	1980	1990	2016	1980	1987, 1990	2016	1980	1990	2000	2016
NFR 1A1, NFR 1A2: oil, gas	NA	±30%	±20%	NA	±50%	±50%	NA	±50%	±50%	±50%
NFR 1A1, 1A2: coal, biomass, peat	NA	±40%	±40%	NA	±50%	±50%	NA	±60%	±60%	±60%
NFR 1A3	NA	±50%	±50%	NA	±50%	±50%	NA	±50%	±50%	±50%
NFR 1A4, 1A5: oil, gas	NA	±30%	±20%	NA	±50%	±50%	NA	±50%	±50%	±50%
NFR 1A4, 1A5: coal, biomass, peat	NA	±40%	±40%	NA	±50%	±50%	NA	±80%	±80%	±80%
NFR 1B1a (peat production)	NA	NA	NA	NA	NA	NA	NA	-100 to +1000%	-100 to 1000%	-100 to +1000%
NFR 3	NA	NA	NA	NA	NA	-100 to +200%	NA	-100 to +1000%	-100 to +1000%	-100 to +1000%
NFR 5C	NA	±30%	±20%		±50%	±50%	NA	±50%	±50%	±50%

NFR 1A1 and 1A2: The majority of the plants included in these categories report their SO<sub>2</sub>, NO<sub>x</sub> and TSP emissions

NFR 1A3: The emission estimates for particular matter from transportation are based on emission factors, the uncertainty of which is estimated at ± 50%.

NFR 1A4 and 1A5: The emission estimates are calculated with emission factors and activity data.

NFR 1B3: The estimates of particle emissions from peat production are poorly understood. Therefore, the uncertainty is estimated to be very large, i.e. –100 to +1000%. NO<sub>x</sub> emissions from manure management were added to the 2017 submission. However, the uncertainty estimates from manure management are considered very rough. More reliable estimates will be developed in the future submissions..

NFR 3: The estimates of particle emissions from agriculture are poorly understood. Therefore, the uncertainty is estimated to be very large, i.e. –100 to +1000%.

NFR 5C: The majority of the plants included in these categories report their SO<sub>2</sub>, NO<sub>x</sub> and TSP emissions.

Note: As mentioned in chapter 1.3, calculation of particle size fractions from total suspended particles introduces additional uncertainty to the emission estimates of the smaller size fractions. However, the uncertainty originating from the allocation of TPS emissions into the different size categories is not estimated presently.

### Heavy metals

The uncertainties in heavy metal emission factors are estimated at ±80% for stationary combustion (1A1, 1A2, 1A4), waste incineration (5C) and industrial processes (2). Uncertainties are estimated somewhat larger (±100%) for transportation (1A3) and NFR categories 2D3 and 2G (solvents).

**Table 2.16. Uncertainty estimates in heavy metal emission factors for 1990 and 2016.**

NFR category	HM	
	1990	2016
NFR 1A1, 1A2, 1A4, 1A5	±80%	±80%
NFR 1A3	±100%	±100%
NFR 2 (industry)	±80%	±80%
NFR 2 (solvents)	±100%	±100%
NFR 5C	±80%	±80%

### NM VOC

Uncertainties in NMVOC emission factors are estimated as presented in Table 2.17

**Table 2.17. Uncertainties in NMVOC emission factors for 1988, 1990 and 2016.**

NFR category	NMVOC		
	1988	1990	2016
NFR 1A1, 1A2	±80%	±80%	±80%
NFR 1A3	±80%, gasoline evaporation ±100%	±80%, gasoline evaporation ±100%	±80%, gasoline evaporation ±100%
NFR 1A4, 1A5	±80%	±80%	±80%
NFR 1B	±100%	±100%	±100%
NFR 2 (industry)	±80%	±80%	±80%
NFR 2 (solvents)	-100% to +200%	-100% to +200%	-100% to +200%
NFR3	NA	NA	-100% to +200%
NFR 5A, 5D	-100% to + 200%	-100% to + 200%	-100% to + 200%

NFR 1A: NMVOC emissions calculated in the emission inventory data system for stationary fuel combustion are estimated by using technology-specific emission factors, the uncertainty of which is estimated to be at ±80% for 1988, 1990 and 2016.

NFR 1A3 NMVOC emissions from the traffic sector are calculated by subtracting the estimate of methane emissions from the estimate of the total emissions of hydrocarbons. The Finnish traffic calculation model LIPASTO provides emission estimates for both hydrocarbons and methane for the different traffic sectors. The uncertainty in the NMVOC emissions is assumed to be ±80%<sup>2</sup>.

<sup>2</sup> The UC estimate could be based on the uncertainty of CH<sub>4</sub> and total organic carbon TOC, and the uncertainty of fuel consumption if there would be an estimate for the uncertainty of the TOC.

NFR 1B Uncertainties in the fugitive emissions from fuels (NFR 1B) are estimated somewhat larger, i.e.  $\pm 100\%$ .

NFR 2 uncertainties are estimated at  $\pm 80\%$ .

NFR 2D3 and 2G (solvents) NMVOC emissions from NFR 3 are derived from many different sources. The emission estimates are considered to contain rather large uncertainties, i.e. from  $-100$  to  $+200\%$  for 1988, 1990 and 2016.

NMVOC emissions from manure management were added to the 2017 submission. However, the uncertainty estimates from manure management are considered very rough. More reliable estimates will be developed in the future submissions.

NFR 5A Emissions for NMVOC emissions from landfills and wastewater treatment have been estimated for the first time for 2006 emissions.

## CO

CO emissions are generated during incomplete combustion and vary notably between different combustion processes, fuels and even in case of the same boiler, according to temporary boiler conditions. Therefore, uncertainties in the calculated CO emission factors are estimated relatively large, i.e.  $\pm 70\%$ , as presented in Table 2.18. Carbon monoxide from stationary combustion and waste incineration are estimated by using emission factors and activity data for those plants that do not report the emissions.

**Table 2.18. Uncertainties in CO emission factors in 1980, 1990 and 2016.**

NFR category	CO		
	1980	1990	2016
NFR 1A1, 1A2	NA	$\pm 70\%$	$\pm 70\%$
NFR 1A3	NA	$\pm 70\%$	$\pm 70\%$
NFR 1A4, 1A5	NA	$\pm 70\%$	$\pm 70\%$
NFR 5C	NA	$\pm 70\%$	$\pm 70\%$

## NH<sub>3</sub>

NFR 1A3 Emission factors for ammonia are based on ammonia emission factors used in the other Nordic countries and adopted to Finnish conditions through and expert estimation at Technical Research Centre of Finland VTT, which is the expert institute for transport sector emissions in Finland.

NFR 3 Research on agricultural NH<sub>3</sub> emissions has been carried out rather extensively in Finland and globally. Country-specific emission factors taking into account Finnish agricultural practices are used in estimation of emissions. The present NH<sub>3</sub> emission factors take into account various issues on which the emission depend, for instance, animal types, manure treatment and animal feeding methods and fertilization practices. However, natural variability in these emission sources is large, and therefore, uncertainty of  $-61\%$  to  $+186\%$  is estimated for emission factors in agriculture for 2016, for details see Grönroos et al., 2009. Uncertainty in 1990 is previously estimated somewhat lower,  $\pm 50\%$ , as the old emission factors were based on estimate published in 1995. The 1990 uncertainties of NH<sub>3</sub> will be re-evaluated parallel with the update of the time series.

**Table 2.19. Uncertainties in NH<sub>3</sub> emission factors 1980, 1990 and 2016.**

NFR category	NH <sub>3</sub>		
	1980	1990	2016
NFR 1A3	NA	±100%	±100%
NFR 3	NA	±50%	-61% to +186%

## POP

POP emissions are estimated with using emission factors from different data sources, such as EMEP/EEA Emission Inventory Guidebook, domestic research or international literature. POP emissions from non-point sources are estimated very uncertain, -100% to +1000% and the same value is used for 1990, 1994 and 2016. (Table 2.20)

**Table 2.20 Uncertainty for POP emission factors in 1990, 1994 and 2016**

NFR	PCDD/F	PAH-4	HCB	PCB	PCP
NFR 1A1, 1A2, 1A4, 1A5	-100 to +1000%	-100 to +1000%	-100 to +1000%	-100 to +1000%	-100 to +1000%
NFR 1A3	-100 to +1000%	-100 to +1000%	-100 to +1000%	-100 to +1000%	-100 to +1000%
NFR 2 (industry)	-100 to +1000%	-100 to +1000%	-100 to +1000%	-100 to +1000%	-100 to +1000%
NFR 2 (solvents)	-100 to +1000%	-100 to +1000%	-100 to +1000%	-	-
NFR 3	-	-	-100 to +1000%	-	-
NFR 5C	-100 to +1000%	-100 to +1000%	-100 to +1000%	-100 to +1000%	-100 to +1000%

### 1.7 QC and planned improvements in uncertainty estimation

For the majority of the calculated data, uncertainties of activity data and emission factors have been defined separately. In the industrial processes sector, uncertainties of emission data reported by the plants have used.

To enable estimating real time uncertainties re-evaluation of uncertainties is carried out every 5<sup>th</sup> year for activity data and emission factors as well as for emission data reported by the plants.

The following QA/QC procedures were carried out for the uncertainty analysis in 2009 (2007 data):

- All uncertainty estimates used in the previous submission were evaluated by an external consultant<sup>3</sup>, and many of the estimates were revised in collaboration with the inventory agency.
- The uncertainty estimates were compared to uncertainty estimates presented the Good Practice Guidance for CLRTAP Inventories.
- Order-of-magnitude comparisons were carried out with other data sources and uncertainty analysis documentations provided by other parties to the CLRTAP conventions.
- Results of these QA/QC procedures lead to changes in some of the inventory uncertainty estimates when compared with the previous submission.

In 2013 for 2011 data uncertainty percentages of activity data, emission factors and emission data reported by the plants were re-evaluated and it was considered that there was no need to change the uncertainty percentages.

In 2016 uncertainty values for fuels were updated to correspond to those used in the Finnish greenhouse gas inventory.

<sup>3</sup> Suvi Monni from Benviroc Ltd

**THE RESULTS OF THE UNCERTAINTY ANALYSIS FOR THE 2017 SUBMISSION WILL BE  
UPLOADED IN THE CDR BY 1<sup>ST</sup> MAY 2019**

*1.8 Uncertainties by pollutants*

Changes in chapter	
May 2018	KS, TF

Uncertainties for all pollutants in 2016 are presented in Table 2.21 by pollutant.

Uncertainties by pollutant and NFR category are presented for main pollutants (sulphur oxides, nitrogen oxides, ammonia, non-methane volatile organic compounds and carbon monoxide) in Tables 2.22 - 2.30, for particles (black carbon, small particles <2.5 and <10 and total suspended particles) in Tables 2.31 - 2.38 and for persistent organic compounds (hexachlorobenzene, polyaromatic hydrocarbons, polychlorinated biphenyls, polychlorinated dioxins and furanes) in Tables 2.39 - 2.42.

**Table 2.21 Total uncertainty of the 2016 emission data by pollutant.**

Compound	Uncertainty*	
	Lower, %	Upper,%
Nitrogen oxide	-11	11
Sulphur dioxide	-5	5
Carbon monoxide	-29	31
NMVOC	-25	27
<i>Ammonia</i> <sup>4</sup>	-44	54
Particulate matter (TSP)	-24	25
Lead	-28	27
Cadmium	-28	28
Mercury	-19	19
Arsenic	-25	25
Chromium	-25	26
Copper	-74	74
Nickel	-15	15
Zinc	-31	32
Hexachlorobenzene	-90	188
Dioxins and furans	-38	51
Polyaromatic hydrocarbons	-81	196
Polychlorinated biphenyls	-64	102
Pentachlorophenol (2011)	-91	233

\*Expressed as upper and lower bounds of the 95% confidence interval relative to the mean value.

The improvements carried out in the inventory, especially after 2010, are not reflected in the uncertainties as the uncertainty percentages have not been re-evaluated. The inventory improvement programme has intensified since 2010 in checking of the completeness, consistency and correctness of the calculations and input data and the correspondence of methodologies to Finnish circumstances. A review of the uncertainty analysis will be carried out to the 2019 submission.

<sup>4</sup> Note: the uncertainty estimates (percentages) in calculation of NH<sub>3</sub> uncertainty were not updated. However, due to improved information and data of the ammonia inventory in 2013-2016 the uncertainty percentages should be re-evaluated. It is likely that the re-evaluation lowers the uncertainties.

## Uncertainties of Main Pollutants NH<sub>3</sub>, CO, NO<sub>x</sub>, NMVOC, and SO<sub>x</sub>

**Table 2.22 Uncertainties in Ammonia (NH<sub>3</sub>) emissions by NFR categories in 2016 data**

Note: the uncertainty estimates (percentages) in calculation of NH<sub>3</sub> uncertainty were not updated. However, due to improved information and data of especially the agricultural and small scale combustion ammonia inventories in 2013-2016, as well as the inclusion of new and missing sources in 2015, the uncertainty percentages should be re-evaluated. It is likely that the re-evaluation lowers the uncertainties.

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-26	26	2D3i	-101	100
1A2gvii	-81	80	2G	-100	116
1A2gviii	-21	20	2H1	-101	101
1A3bi	-56	56	2L	-101	99
1A3bii	-52	51	3B1a	-97	147
1A3biii	-56	57	3B1b	-96	147
1A3biv	-55	54	3B2	-97	146
1A3c	-80	81	3B3	-97	148
1A3dii	-80	82	3B4d	-97	146
1A4ai	-80	87	3B4e	-97	147
1A4aii	-78	81	3B4gi	-97	147
1A4bi	-81	86	3B4gii	-97	147
1A4bii	-80	83	3B4giii	-97	147
1A4ci	-81	87	3B4giv	-96	147
1A4cii	-81	83	3B4h	-97	148
1A4ciii	-81	82	3Da1	-41	42
1A5a	-81	92	3Da2a	-97	174
1B1b	-81	93	3Da2b	-100	112
2B10a	-99	100	3Da3	-97	174
2C1	-100	101	3F	-101	112
2C7b	-101	101	5B1	-97	162
2C7c	-100	100	5D1	-101	101
2D3g	-83	86	5E	-101	243
			<b>Total</b>	<b>-44</b>	<b>54</b>

**Table 2.23 Uncertainties in Carbon monoxide (CO) emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-41	42	1A2d	-49	50
1A1b	-30	30	1A2e	-43	43
1A2a	-39	39	1A2f	-30	30
1A2b	-18	18	1A2gvii	-70	70
1A2c	-50	50	1A2gviii	-62	63
			1A3ai(i)	-69	71
			1A3aii(i)	-63	63



1A3bi	-68	68
1A3bii	-51	51
1A3biii	-71	71
1A3biv	-70	70
1A3c	-70	71
1A3dii	-70	73
1A3ei	-71	70
1A4ai	-48	51
1A4aai	-71	74
1A4bi	-71	77
1A4bii	-70	74

1A4ci	-52	55
1A4cii	-71	74
1A4ciii	-70	72
1A5a	-66	66
1A5b	-55	66
2C1	-20	20
2C7a	-20	21
2G	-100	116
3F	-100	113
<b>Total</b>	<b>-29</b>	<b>31</b>

**Table 2.24 Uncertainties in Nitrogen oxides (NOx) emissions by NFR categories in 2016**

NFR	Uncertainty	
	Lower%	Upper%
1A1a	-9	9
1A1b	-17	17
1A2a	-20	20
1A2b	-20	20
1A2c	-19	19
1A2d	-9	9
1A2e	-19	19
1A2f	-17	17
1A2gvii	-51	51
1A2gviii	-16	16
1A3ai(i)	-51	52
1A3aai(i)	-51	51
1A3bi	-36	36
1A3bii	-49	49
1A3biii	-51	51
1A3biv	-42	43
1A3c	-50	51
1A3dii	-51	52
1A3ei	-20	21
1A4ai	-37	39
1A4aai	-50	53
1A4bi	-42	46
1A4bii	-51	55

1A4ci	-32	35
1A4cii	-51	55
1A4ciii	-50	52
1A5a	-33	35
1A5b	-63	81
2B10a	-21	20
2B2	-20	20
2G	-100	117
3B1a	-97	152
3B1b	-97	153
3B2	-97	154
3B3	-97	153
3B4d	-97	154
3B4e	-97	155
3B4gi	-97	151
3B4gii	-97	153
3B4giii	-97	153
3B4giv	-97	154
3B4h	-97	154
3Da1	-102	101
3Da2a	-97	179
3Da2b	-97	165
3Da3	-97	180
3F	-100	113
<b>Total</b>	<b>-11</b>	<b>11</b>

**Table 2.25 Uncertainties in Non-Methane Volatile Organic Compounds (NMVOC) emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-35	34			
1A1b	-28	29			
1A2a	-50	51			
1A2b	-39	39			
1A2c	-40	40			
1A2d	-42	42			
1A2e	-57	57			
1A2f	-36	36			
1A2gvii	-80	81			
1A2gviii	-50	51			
1A3ai(i)	-81	81			
1A3aii(i)	-79	78			
1A3bi	-74	74			
1A3bii	-69	69			
1A3biii	-81	81			
1A3biv	-77	78			
1A3bv	-97	153			
1A3c	-80	80			
1A3dii	-80	82			
1A3ei	-80	81			
1A4ai	-53	55			
1A4aii	-76	80			
1A4bi	-80	86			
1A4bii	-80	84			
1A4ci	-74	85			
1A4cii	-81	84			
1A4ciii	-80	83			
1A5a	-55	56			
1A5b	-76	100			
1B1b	-80	83			
1B2aiv	-31	30			
1B2av	-93	99			
1B2b	-101	101			
2A1	-86	87			
2A3	-99	100			
2B10a	-100	101			
2B10b	-100	101			
2C1			-99		100
2C2			-100		100
2C6			-81		82
2C7a			-100		100
2C7b			-101		101
2C7c			-100		101
2D3a			-97		158
2D3b			-82		92
2D3c			-81		93
2D3d			-74		103
2D3e			-94		154
2D3g			-78		86
2D3h			-85		86
2D3i			-88		156
2G			-97		167
2H1			-70		72
2H2			-81		93
2I			-64		68
2L			-99		100
3B1a			-97		153
3B1b			-97		152
3B2			-97		154
3B3			-97		154
3B4d			-97		154
3B4e			-97		154
3B4gi			-97		154
3B4gii			-97		153
3B4giii			-97		153
3B4giv			-97		154
3B4h			-97		153
3Da2a			-97		180
3Da3			-97		178
3De			-101		112
3F			-100		111
5A			-97		155
5B2			-97		154
5D1			-93		149
5D2			-97		154
<b>Total</b>			<b>-25</b>		<b>27</b>

**Table 2.26 Uncertainties in Sulphur oxides (SO<sub>x</sub>, calculated as SO<sub>2</sub>) emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-9	9	1A4aii	-51	53
1A1b	-13	14	1A4bi	-21	23
1A2a	-10	10	1A4bii	-51	54
1A2b	-15	15	1A4ci	-25	28
1A2c	-14	14	1A4cii	-52	55
1A2d	-8	8	1A4ciii	-51	52
1A2e	-14	14	1A5a	-25	28
1A2f	-17	18	1A5b	-63	81
1A2gvii	-51	51	1B1b	-15	16
1A2gviii	-13	13	2B10a	-16	16
1A3ai(i)	-51	51	2C1	-15	16
1A3aii(i)	-51	51	2C2	-15	15
1A3bi	-39	38	2C7a	-16	16
1A3bii	-49	49	2C7b	-15	16
1A3biii	-51	51	2C7c	-16	16
1A3biv	-48	48	2D3g	-26	25
1A3c	-50	50	2D3i	-25	25
1A3dii	-51	53	2G	-101	116
1A3ei	-21	21	2H1	-17	17
1A4ai	-23	25	2L	-26	26
			3F	-100	113
			<b>Total</b>	<b>-5</b>	<b>5</b>

***Uncertainties in particle emissions: BC, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP***

**Table 2.27 Uncertainties in BC emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-78	105	1A3biv	-96	216
1A1b	-96	136	1A3bvi	-100	248
1A2a	-96	136	1A3bvii	-101	246
1A2b	-96	137	1A3c	-100	249
1A2c	-96	137	1A3dii	-101	249
1A2d	-96	136	1A4ai	-87	172
1A2e	-96	137	1A4aii	-100	248
1A2f	-96	135	1A4bi	-96	239
1A2gvii	-101	246	1A4bii	-101	251
1A2gviii	-96	137	1A4ci	-93	240
1A3ai(i)	-101	248	1A4cii	-101	252
1A3aii(i)	-100	248	1A4ciii	-101	249
1A3bi	-97	216	1A5a	-99	265
1A3bii	-101	249	1A5b	-100	270
1A3biii	-100	249	1B1b	-96	136
			2A2	-96	136
			2A3	-96	136

2B10a	-92	185	2G	-101	443
2B6	-96	136	2H1	-87	113
2C1	-96	136	3F	-100	434
2C2	-96	136	5C1bv	-100	430
2C3	-96	136	5E	-101	432
2C7a	-96	136	<b>Total</b>	<b>-56</b>	<b>94</b>
2D3b	-100	432			
2D3i	-96	135			

**Table 2.28 Uncertainties in Small particles PM2.5 emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-76	94	2A3	-96	136
1A1b	-96	136	2A5a	-86	116
1A2a	-96	136	2A5b	-99	357
1A2b	-96	136	2A5c	-100	364
1A2c	-96	136	2B10a	-93	184
1A2d	-96	135	2B10b	-100	367
1A2e	-96	135	2B6	-96	135
1A2f	-96	136	2C1	-96	135
1A2gvii	-97	165	2C2	-96	136
1A2gviii	-96	136	2C3	-96	137
1A3ai(i)	-97	165	2C7a	-96	136
1A3aii(i)	-95	162	2C7c	-96	136
1A3bi	-89	145	2C7d	-100	375
1A3bii	-96	164	2D3b	-100	365
1A3biii	-97	163	2D3d	-96	134
1A3biv	-88	143	2D3e	-100	220
1A3bvi	-97	164	2D3g	-96	136
1A3bvii	-97	165	2D3i	-96	137
1A3c	-97	164	2G	-100	375
1A3dii	-97	165	2H1	-87	114
1A4ai	-77	116	2H2	-94	332
1A4aii	-96	166	2L	-96	135
1A4bi	-89	173	3B1a	-100	360
1A4bii	-97	167	3B1b	-100	368
1A4ci	-87	172	3B3	-100	358
1A4cii	-97	167	3B4e	-100	367
1A4ciii	-97	165	3B4gi	-100	364
1A5a	-94	188	3B4gii	-100	369
1A5b	-97	194	3B4giii	-100	364
1B1b	-96	135	3B4giv	-100	363
1B1c	-100	359	3Dc	-100	365
1B2av	-97	137	3F	-100	367
2A2	-96	136	5A	-100	366
			5C1bv	-100	366
			5E	-100	373

<b>Total</b>	<b>-44</b>	<b>58</b>
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**Table 2.29 Uncertainties in Small particles PM10 emissions by NFR categories in 2016 data**

NFR	Uncertainty			
	Lower%	Upper%		
1A1a	-76	95	2A5a	-86 115
1A1b	-96	136	2A5b	-99 364
1A2a	-96	136	2A5c	-100 371
1A2b	-96	136	2B10a	-93 186
1A2c	-96	136	2B10b	-100 371
1A2d	-96	136	2B6	-96 135
1A2e	-97	135	2C1	-96 137
1A2f	-97	137	2C2	-96 136
1A2gvii	-97	165	2C3	-96 137
1A2gviii	-96	135	2C7a	-96 137
1A3ai(i)	-97	165	2C7c	-96 136
1A3aii(i)	-95	163	2C7d	-100 369
1A3bi	-89	145	2D3b	-100 367
1A3bii	-97	164	2D3d	-96 135
1A3biii	-97	163	2D3e	-100 223
1A3biv	-88	142	2D3g	-96 136
1A3bvi	-97	162	2D3i	-96 136
1A3bvii	-97	163	2G	-100 369
1A3c	-97	165	2H1	-87 115
1A3dii	-96	166	2H2	-94 335
1A4ai	-78	116	2I	-96 135
1A4aii	-97	166	2L	-96 136
1A4bi	-89	174	3B1a	-100 367
1A4bii	-96	169	3B1b	-100 366
1A4ci	-87	171	3B3	-100 361
1A4cii	-96	166	3B4e	-100 359
1A4ciii	-97	166	3B4gi	-100 357
1A5a	-94	189	3B4gii	-100 366
1A5b	-97	191	3B4giii	-100 362
1B1b	-96	136	3B4giv	-100 362
1B1c	-100	365	3Dc	-100 357
1B2av	-96	136	3F	-100 367
2A2	-96	136	5A	-100 357
2A3	-96	136	5C1bv	-100 359
			5E	-100 367
			<b>Total</b>	<b>-44 58</b>

**Table 2.30 Uncertainties in Total Suspended Particles (TSP) emissions by NFR categories in 2016 data**

NFR	Uncertainty			
	Lower%	Upper%		
1A1a	-21	21	2A5a	-27 45
1A1b	-21	20	2A5b	-97 242
1A2a	-21	20	2A5c	-98 249
1A2b	-21	21	2B10a	-82 81
1A2c	-20	20	2B10b	-98 250
1A2d	-20	21	2B6	-21 21
1A2e	-21	21	2C1	-21 20
1A2f	-21	20	2C2	-21 20
1A2gvii	-51	51	2C3	-20 21
1A2gviii	-21	21	2C7a	-21 20
1A3ai(i)	-51	51	2C7c	-20 20
1A3aii(i)	-50	51	2C7d	-98 246
1A3bi	-45	45	2D3b	-98 252
1A3bii	-51	50	2D3d	-21 21
1A3biii	-50	50	2D3e	-100 101
1A3biv	-44	44	2D3g	-20 21
1A3bvi	-50	50	2D3i	-21 21
1A3bvii	-50	50	2G	-98 252
1A3c	-51	51	2H1	-28 28
1A3dii	-51	52	2H2	-90 229
1A4ai	-39	41	2I	-21 21
1A4aii	-51	54	2L	-21 20
1A4bi	-69	73	3B1a	-98 239
1A4bii	-51	54	3B1b	-98 243
1A4ci	-67	77	3B3	-98 239
1A4cii	-52	55	3B4e	-98 240
1A4ciii	-51	52	3B4gi	-98 242
1A5a	-76	77	3B4gii	-98 238
1A5b	-62	81	3B4giii	-98 240
1B1b	-20	20	3B4giv	-98 239
1B1c	-98	242	3Dc	-98 241
1B2av	-20	20	3F	-98 246
2A2	-21	21	5A	-98 243
2A3	-21	20	5C1bv	-98 239
			5E	-98 250
			<b>Total</b>	<b>-24 25</b>

## Uncertainties of Heavy Metals

Table 2.31 Uncertainties in Arsenic (As) emissions by NFR categories in 2016 data

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-42	42	1A4ai	-48	52
1A1b	-80	81	1A4bi	-66	70
1A2a	-36	36	1A4ci	-78	89
1A2b	-80	79	1A4ciii	-101	102
1A2c	-64	64	1A5a	-61	63
1A2d	-63	63	1B1b	-31	31
1A2e	-74	75	2A5b	-30	30
1A2f	-62	61	2C1	-30	30
1A2gviii	-43	43	2C2	-31	31
1A3bi	-85	86	2C6	-31	31
1A3bii	-96	96	2C7a	-31	31
1A3biii	-100	101	2C7c	-31	31
1A3biv	-97	99	2G	-100	117
1A3bvi	-100	100	3F	-100	112
1A3dii	-102	102	5C1bv	-81	82
			5E	-100	116
			<b>Total</b>	<b>-25</b>	<b>25</b>

Table 2.32 Uncertainties in Cadmium (Cd) emissions by NFR categories in 2016 data

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-41	42	1A4aai	-98	102
1A1b	-72	71	1A4bi	-80	85
1A2a	-30	30	1A4bii	-101	104
1A2b	-80	81	1A4ci	-66	69
1A2c	-62	61	1A4cii	-101	103
1A2d	-75	74	1A4ciii	-101	102
1A2e	-52	52	1A5a	-80	81
1A2f	-55	55	1B1b	-30	31
1A2gvii	-101	101	2A5b	-31	30
1A2gviii	-73	75	2C1	-31	30
1A3bi	-75	75	2C2	-31	31
1A3bii	-98	99	2C6	-31	31
1A3biii	-102	100	2C7a	-30	30
1A3biv	-95	95	2C7c	-31	31
1A3bvi	-101	101	2G	-100	115
1A3c	-100	101	3F	-100	113
1A3dii	-100	102	5C1bv	-81	82
1A4ai	-74	79	5E	-100	117
			<b>Total</b>	<b>-28</b>	<b>28</b>

**Table 2.33 Uncertainties in Chromium (Cr) emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-38	38	1A4ai	-69	74
1A1b	-80	79	1A4aia	-98	101
1A2a	-28	28	1A4bia	-80	85
1A2b	-81	80	1A4bii	-101	104
1A2c	-58	59	1A4ci	-59	63
1A2d	-38	38	1A4cii	-101	104
1A2e	-70	71	1A4ciii	-100	101
1A2f	-60	60	1A5a	-80	81
1A2gvii	-101	101	1B1b	-31	30
1A2gviii	-70	72	2A5b	-31	30
1A3bi	-71	71	2C1	-31	31
1A3bii	-101	100	2C2	-31	31
1A3biii	-100	100	2C7c	-31	30
1A3biv	-88	88	2G	-100	116
1A3bvi	-100	101	3F	-101	114
1A3c	-101	100	5C1bv	-80	82
1A3dii	-101	103	5E	-100	117
			<b>Total</b>	<b>-25</b>	<b>26</b>

**Table 2.34 Uncertainties in Copper (Cu) emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-38	38	1A4aia	-99	102
1A1b	-76	75	1A4bia	-73	77
1A2a	-43	44	1A4bii	-101	105
1A2b	-80	81	1A4ci	-74	85
1A2c	-53	53	1A4cii	-100	103
1A2d	-32	32	1A4ciii	-100	101
1A2e	-73	72	1A5a	-80	80
1A2f	-58	58	1B1b	-30	31
1A2gvii	-100	101	2A5b	-30	30
1A2gviii	-71	71	2B10a	-31	30
1A3bi	-80	80	2C1	-31	31
1A3bii	-97	98	2C2	-31	30
1A3biii	-100	100	2C6	-30	30
1A3biv	-96	96	2C7a	-31	30
1A3bvi	-100	100	2C7c	-31	30
1A3c	-100	101	2G	-100	115
1A3dii	-99	102	3F	-101	113
1A4ai	-49	53	5C1bv	-80	82
			5E	-101	116
			<b>Total</b>	<b>-74</b>	<b>74</b>



**Table 2.35 Uncertainties in Mercury (Hg) emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-34	34	1A4ai	-67	71
1A1b	-76	76	1A4bi	-80	85
1A2a	-61	62	1A4ci	-58	64
1A2b	-80	79	1A4ciii	-100	101
1A2c	-39	39	1A5a	-78	79
1A2d	-56	57	1B1b	-81	82
1A2e	-42	42	2A5b	-50	50
1A2f	-39	38	2B10a	-51	51
1A2gviii	-43	43	2C1	-51	50
1A3bi	-79	77	2C2	-50	50
1A3bii	-98	98	2C6	-51	50
1A3biii	-100	100	2C7c	-51	51
1A3biv	-96	97	2G	-101	115
1A3bvi	-100	100	3F	-102	113
1A3dii	-100	102	5C1bv	-80	81
			5E	-100	117
			<b>Total</b>	<b>-19</b>	<b>19</b>

**Table 2.36 Uncertainties in Nickel (Ni) emissions by NFR categories in 2016 data**

NFR	Uncertainty				
	Lower%	Upper%			
1A1a	-31	31	1A4aai	-98	102
1A1b	-36	36	1A4bi	-76	82
1A2a	-29	29	1A4bii	-100	104
1A2b	-62	62	1A4ci	-51	54
1A2c	-76	77	1A4cii	-101	104
1A2d	-36	36	1A4ciii	-101	103
1A2e	-44	44	1A5a	-49	51
1A2f	-58	58	1B1b	-31	30
1A2gvii	-101	101	2A5b	-31	30
1A2gviii	-48	47	2B10a	-30	31
1A3bi	-77	76	2C1	-30	31
1A3bii	-98	98	2C2	-30	30
1A3biii	-101	102	2C7a	-30	30
1A3biv	-96	96	2C7b	-30	30
1A3bvi	-101	100	2C7c	-30	30
1A3c	-99	101	2G	-100	116
1A3dii	-100	102	3F	-100	113
1A4ai	-65	68	5C1bv	-80	81
			<b>Total</b>	<b>-15</b>	<b>15</b>

**Table 2.37 Uncertainties in Lead (Pb) emissions by NFR categories in 2016 data**

NFR	Uncertainty			
	Lower%	Upper%		
1A1a	-37	37	1A4ai	-47 49
1A1b	-79	78	1A4bi	-76 80
1A2a	-27	27	1A4ci	-68 76
1A2b	-80	81	1A4ciii	-100 102
1A2c	-71	70	1A5a	-75 76
1A2d	-76	76	1B1b	-30 31
1A2e	-66	65	2A5b	-30 31
1A2f	-60	60	2C1	-31 31
1A2gviii	-67	68	2C2	-30 30
1A3aii(i)	-101	106	2C6	-31 31
1A3bi	-71	71	2C7a	-30 30
1A3bii	-99	99	2C7c	-30 30
1A3biii	-101	100	2G	-101 116
1A3biv	-90	90	3F	-100 112
1A3bvi	-100	101	5C1bv	-80 81
1A3dii	-100	102	5E	-101 117
			<b>Total</b>	<b>-28 27</b>

**Table 2.38 Uncertainties in Zinc (Zn) emissions by NFR categories in 2016 data**

NFR	Uncertainty			
	Lower%	Upper%		
1A1a	-50	50	1A4ai	-79 84
1A1b	-68	68	1A4aii	-98 102
1A2a	-32	33	1A4bi	-80 86
1A2b	-80	81	1A4bii	-100 102
1A2c	-48	49	1A4ci	-71 76
1A2d	-56	57	1A4cii	-100 104
1A2e	-50	50	1A4ciii	-101 102
1A2f	-52	52	1A5a	-81 82
1A2gvii	-100	101	1B1b	-31 30
1A2gviii	-65	66	2C1	-30 31
1A3bi	-75	76	2C2	-30 30
1A3bii	-98	100	2C6	-31 31
1A3biii	-101	100	2C7a	-30 30
1A3biv	-95	95	2C7c	-30 31
1A3bvi	-102	101	2G	-102 117
1A3c	-100	100	3F	-101 112
1A3dii	-100	102	5C1bv	-80 82
			<b>Total</b>	<b>-31 32</b>

## Uncertainties of Persistent Organic Compounds (POPs)

**Table 2.39 Uncertainties in Hexachlorobenzene (HCB) emissions by NFR categories in 2016 data**

NFR	Uncertainty			
	Lower%	Upper%		
1A1a	-97	236	1A4ai	-98 242
1A2a	-98	242	1A4bi	-98 241
1A2c	-98	240	1A4ci	-94 228
1A2d	-97	241	1A4ciii	-98 239
1A2e	-98	237	1A5a	-94 231
1A2f	-98	241	2B10a	-98 213
1A2gviii	-95	260	2C1	-98 284
1A3bi	-98	238	2C7a	-98 239
1A3bii	-98	238	2C7c	-98 241
1A3biii	-98	241	2D3i	-98 254
1A3biv	-98	239	3Df	-98 243
1A3dii	-98	240	5C1bv	-98 237
			<b>Total</b>	<b>-90 188</b>

**Table 2.40 Uncertainties in Polyaromatic Hydrocarbon (PAH-4) emissions by NFR categories in 2016 data**

NFR	Uncertainty			
	Lower%	Upper%		
1A1a	-73	117	1A4ai	-87 160
1A1b	-80	136	1A4aai	-96 236
1A2a	-86	186	1A4bi	-97 241
1A2b	-87	158	1A4bii	-98 241
1A2c	-88	176	1A4ci	-89 207
1A2d	-78	145	1A4cii	-98 241
1A2e	-72	122	1A5a	-85 174
1A2f	-75	145	1B1b	-98 241
1A2gvii	-98	238	2A1	-98 242
1A2gviii	-86	197	2B10a	-98 215
1A3bi	-98	237	2C1	-93 223
1A3bii	-98	239	2C2	-98 243
1A3biii	-98	241	2D3i	-97 242
1A3biv	-98	239	2G	-98 248
1A3c	-98	237	3F	-98 250
			5C1bv	-98 242
			<b>Total</b>	<b>-81 196</b>

**Table 2.41 Uncertainties in Polychlorinated biphenyls (PCBs) emissions by NFR categories in 2016 data**

NFR	Uncertainty	
	Lower%	Upper%
1A2gviii	-100	317
1A3bi	-80	138
1A3bii	-86	157
1A3biii	-87	158
1A3biv	-83	152
1A3dii	-98	244
1A4ai	-97	239
1A4bi	-98	243
1A4ci	-98	244
1A4ciii	-98	242
1B1b	-98	243
1B2aiv	-98	247
2A1	-98	249
2A2	-98	245
2B10a	-97	214
2C1	-88	167
2C3	-98	249
2C7a	-98	243
2C7c	-90	196
5C1bv	-98	250
<b>Total</b>	<b>-64</b>	<b>102</b>

**Table 2.42 Uncertainties in Polychlorinated dioxins and furans (PCDD/F) emissions by NFR categories in 2016 data**

NFR	Uncertainty	
	Lower%	Upper%
1A1a	-68	106
1A1b	-79	169
1A2a	-69	118
1A2b	-90	191
1A2c	-76	156
1A2d	-79	138
1A2e	-85	187
1A2f	-76	162
1A2gviii	-82	168
1A3bi	-49	121
1A3bii	-49	119
1A3biii	-49	120
1A3biv	-49	119
1A3dii	-98	240
1A3ei	-98	241
1A4ai	-90	219
1A4bi	-97	243
1A4ci	-89	192
1A4ciii	-98	238
1A5a	-95	236
1B1b	-98	242
2A1	-98	248
2A2	-98	247
2A3	-98	248
2B10a	-98	217
2C1	-97	214
2C6	-98	241
2C7a	-98	241
2C7c	-97	212
2D3b	-98	251
2G	-98	250
2L	-98	249
3F	-98	247
5C1bv	-98	239
5E	-98	251
<b>Total</b>	<b>-38</b>	<b>51</b>

### References

EEA (2013). EMEP/EEA Emission Inventory Guidebook.

Monni. S. & Syri. S.. Savolainen. I. (2003). Uncertainties in the Finnish greenhouse gas emission inventory. Environmental Science & Policy. Vol. 7 (2004) NO:2. 87-98.

Monni. S (2004). Uncertainties in the Finnish 2002 Greenhouse Gas Emission Inventory. VTT. Espoo. 31 p. + app. 18 p. VTT Working Papers 5.  
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## Annex 8

### Energy Balance

Energy balances are available in Finland's PX-Web databases from [http://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin\\_ene\\_ehk/statfin\\_ehk\\_pxt\\_002.px/?rxid=5c37441a-ed98-40ad-bfb5-5f29f4898d81](http://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin_ene_ehk/statfin_ehk_pxt_002.px/?rxid=5c37441a-ed98-40ad-bfb5-5f29f4898d81)

You can select the years, fuels and quantity (TJ), Twh, Share (%) and Annual change (%) and make searches to create output files and graphs as presented in Figure x.

002 -- Total energy consumption by source (detailed)

The screenshot shows the 'Select variable' tab of the PX-Web interface. It features three columns for selection: 'Year \*', 'Source \*', and 'Tiedot \*'. Each column has a list of options, a search box, and a 'Beginning of row' checkbox. Below the selection area, there is a 'Number of selected data cells are: 0' message and a list of output formats including Table - Layout 2, Chart - Line, Chart - Bar, Table - Layout 1, Tab delimited with heading, Semicolon delimited with heading, Excel (xlsx) with code and text column, Excel workbook (xml) with code and text, Excel workbook (xml), Excel (xlsx), Comma delimited with heading, PX-file, and Space delimited with heading. A 'Continue' button is also visible. At the bottom, contact information for Tietokeskus is provided.

Year *	Source *	Tiedot *
<input checked="" type="checkbox"/> 2012 <input checked="" type="checkbox"/> 2013 <input checked="" type="checkbox"/> 2014 <input checked="" type="checkbox"/> 2015 <input checked="" type="checkbox"/> 2016 <input checked="" type="checkbox"/> 2017	<input checked="" type="checkbox"/> Diesel fuel <input checked="" type="checkbox"/> Refinery gases etc. <input checked="" type="checkbox"/> Town gas <input checked="" type="checkbox"/> Light fuel oil <input checked="" type="checkbox"/> Recycled fuels <input checked="" type="checkbox"/> Recycled oil	<input checked="" type="checkbox"/> Quantity, TJ <input checked="" type="checkbox"/> TWh <input checked="" type="checkbox"/> Share % <input checked="" type="checkbox"/> Annual change %

Number of selected data cells are: 0 (maximum number allowed is 1,000,000)

Table - Layout 2  
Chart - Line  
Chart - Bar  
Table - Layout 1  
Tab delimited with heading  
Semicolon delimited with heading  
Excel (xlsx) with code and text column  
Excel workbook (xml) with code and text  
Excel workbook (xml)  
Excel (xlsx)  
Comma delimited with heading  
PX-file  
Space delimited with heading

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Figure x. Energy balance data available from Finland's PX-Web databases

## **Annex 9**

**Recalculations in the 2019 submission  
to the 2017 submission**

**will be uploaded in the CDR by 1<sup>st</sup> May 2019**