Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts

Table S1. The ^{238}U, ^{234}U, ^{235}U, ^{232}Th, ^{226}Ra, ^{228}Ra, ^{224}Ra, ^{210}Pb and ^{210}Po concentrations (in Bq kg^{-1}) in samples collected from the coal power plant, steel-making industry and refractory material industry in Italy in 2003.

Sample code	Sampling Site	Sample species	^{238}U	^{234}U	^{235}U	^{232}Th	^{226}Ra	^{228}Ra	^{224}Ra	^{210}Pb	^{210}Po
COD 1/A	Coal power plant GE	Bottom ash in winter 2001	92.0±5.1	92.1±5.1	4.49±0.33	-	91.3±4.7	74.9±4.8	29.7±3.4	43.6±1.8	87.2±4.9
COD 2/A	Coal power plant GE	Bottom ash in autumn 2000	48.2±1.6	57.7±1.8	2.58±0.22	-	45.6±2.4	29.6±2.5	49.9±4.7	25.7±1.1	49.7±3.0
COD 3/A	Coal power plant GE	Fly ash in autumn 2000	88.8±4.8	92.4±4.9	4.06±0.64	-	73.7±3.8	52.5±3.8	85.8±6.8	75.8±3.2	74.6±4.1
COD 4/A	Coal power plant Vado Ligure	Fly ash in spring 2000	154±6	154±6	7.83±0.69	-	142±7	89.1±5.9	155±11	143±6	161±9
COD 5/A	ILVA steel plant GE	Converter electrofilter dust	4.77±0.24	4.77±0.24	0.21±0.03	-	8.08±0.80	1.60±0.83	2.08±1.14	292±13	444±24
COD 6/A	ILVA steel plant GE	Blast furnace dust	10.0±0.8	11.1±0.9	0.40±0.21	-	8.89±0.87	5.45±1.01	7.75±1.79	43.4±1.8	61.5±5.0
COD 1	Refractory sepr	Zirconium sand	4215±205	4175±203	214±17	517±31	3878±167	678±32	1489±93	2908±119	3387±187
COD 2	Refractory sepr	Melting furnace dust	327±16	323±16	13.2±1.8	27.0±1.6	92.9±4.7	17.9±1.8	46.3±4.9	17076±701	36953±1818
COD 4	Refractory sepr	Product 1	1677±78	1639±77	72.4±4.3	310±19	1790±78	397±23	544±38	882±36	1004±55
COD 5	Refractory sepr	Product 2	1629±87	1655±89	75.7±5.1	262±16	1617±70	272±21	405±33	687±28	668±37
COD 6	Refractory sepr	Product 3	1776±83	1753±82	93.8±6.5	250±15	1596±69	281±20	423±32	1198±49	1015±47
COD 7	Refractory sepr	Product 4	25.5±1.4	24.7±1.4	1.41±0.15	2.00±0.14	17.2±1.2	6.01±1.00	7.45±1.67	17.6±0.8	45.1±2.4
COD 8	Refractory sepr	Grinding waste dust	1320±57	1308±56	59.1±4.2	178±11	1262±54	203±11	311±26	992±41	1134±58
COD 9	Refractory sepr	Depuration sludge	1662±76	1653±75	74.3±5.2	238±14	1483±63	235±14	662±52	1000±41	1145±61

Table S2. Characteristics of the sampling sites for atmospheric particulate (AP) collected in the sampling campaign of Nov. 2008 [the mean (range) mass concentration of particle: 13.6±8.4 (3.84 - 30.68) μg m^{-3}].

Sample code	Aerodynamic diameter, μm	Sampling site	Sampling date	Sampling volume, m^3	Mass concentration of particle, μg m^{-3}	Latitude (N)	Longitude (E)
AP 7	≤ 2.5	Via Machiavelli, Taranto	11-11-2008	1621.36	19.16	40°29'18.76”	17°13' 33.47"
AP 8	≤ 2.5	Via Machiavelli, Taranto	12-11-2008	1632.73	13.91	40°29'18.76”	17°13' 33.47"
AP 9	≤ 2.5	Via Machiavelli, Taranto	13-11-2008	1338.25	4.73	40°29'18.76”	17°13' 33.47"
AP 10	≤ 2.5	Cisi, Taranto	14-11-2008	1565.65	5.87	40°29' 39.74"	17°13' 33.47"
AP 11	≤ 2.5	Cisi, Taranto	15-11-2008	216.03	3.84	40°29' 39.74"	17°13' 33.47"
AP 12	≤ 2.5	Cisi, Taranto	16-11-2008	1606.58	5.03	40°29' 39.74"	17°13' 33.47"
AP 1	≤ 10	Via Machiavelli, Taranto	11-11-2008	1609.99	30.68	40°29'18.76”	17°13' 33.47"
AP 2	≤ 10	Via Machiavelli, Taranto	12-11-2008	1608.85	22.01	40°29'18.76”	17°13' 33.47"
AP 3	≤ 10	Via Machiavelli, Taranto	13-11-2008	1331.43	9.82	40°29'18.76”	17°13' 33.47"
AP 4	≤ 10	Cisi, Taranto	14-11-2008	1586.11	14.86	40°29' 39.74"	17°13' 33.47"
AP 5	≤ 10	Cisi, Taranto	15-11-2008	204.66	21.47	40°29' 39.74"	17°13' 33.47"
AP 6	≤ 10	Cisi, Taranto	16-11-2008	1590.66	11.85	40°29' 39.74"	17°13' 33.47"
AP 13	≤ 10	Castel Romano, Roma	19/29-11-2008	550.346	21.27	41°42'11.37"	12°26' 52.77"

Table S3. Characteristics of the sampling sites for atmospheric particulate (AP) collected in the sampling campaign of May 2009.

Sample code	Aerodynamic diameter, µm	Sampling site	Sampling date	Sampling volume, m^3	Latitude (N)	Longitude (E)
AP14	≤ 2.5	Alto Adige, Taranto	4/5-5-2009	110.4	40°27'38.58"	17°15'49.04"
AP15	≤ 2.5	Alto Adige, Taranto	6/7-5-2009	110.4	40°27'38.58"	17°15'49.04"
AP16	≤ 2.5	Via Machiavelli, Taranto	4/5-5-2009	110.4	40°29'18.76"	17°13'33.15"
AP17	≤ 2.5	Via Machiavelli, Taranto	6/7-5-2009	110.4	40°29'18.76"	17°13'33.15"
AP18	≤ 10	Via delle Sorgenti, Statte	4/5-5-2009	110.4	40°33'44.95"	17°12'12.33"
AP19	≤ 10	Via delle Sorgenti, Statte	6/7-5-2009	110.4	40°33'44.95"	17°12'12.33"
AP20	≤ 10	Via delle Sorgenti, Statte	8/9-5-2009	110.4	40°33'44.95"	17°12'12.33"
AP21	≤ 10	Via delle Sorgenti, Statte	10/12-5-2009	165.6	40°33'44.95"	17°12'12.33"
AP22	≤ 10	San Vito, Taranto	4/5-5-2009	110.4	40°25'23.96"	17°13'31.66"
AP23	≤ 10	San Vito, Taranto	6/7-5-2009	110.4	40°25'23.96"	17°13'31.66"
AP24	≤ 10	San Vito, Taranto	8/9-5-2009	165.6	40°25'23.96"	17°13'31.66"

Table S4. Characteristics of the sampling sites for surficial soil (SS).

Sample code	Sampling site	Sampling date	Latitude (N)	Longitude (E)	Description of the sampling sites
SS1	Piazza del Gesù, Taranto	02-11-2008	40°29' 39.74"	17°13' 33.47"	1.6 km (S-SE) from the ILVA
SS2	Via Raimondello Orsini, Taranto	02-11-2008	40°29' 46.98"	17°13' 33.52"	1.3 km (S-SE) from the ILVA
SS3	Via Cannata, Taranto	02-11-2008	40°31'9.87"	17°16'15.18"	4.4 km (S-NE) from the ILVA (Paolo VI)
SS4	Via del Tratturello, Taranto	02-11-2008	40°29' 39.74"	17°15'11.51"	3.0 km (NE) from the ILVA (Cisi)
SS5	Via delle Sorgenti, Statte	02-11-2008	40°33'45.00"	17°12'12.00"	6.5 km (N-NW) from the ILVA
SS6	Via Santerano, Gioia del Colle	02-11-2008	40°46' 1.44"	16°52'25.57"	41 km (NW) from the ILVA (background)
SS7	Castel Romano, Roma	03-11-2008	41°42'12.15"	12°26'47.89"	Laboratory ISPRA, Roma (background)

Table S5. The ^{210}Po and ^{210}Pb concentrations in µBq m^{-3} in atmospheric particulate (AP) collected from the area of the ILVA Taranto on 4 - 12 May 2009.

Sample code	Sampling site	Aerodynamic diameter, µm	Po yield, %	^{210}Po	Pb yield, %	^{210}Pb	^{210}Po/^{210}Pb
AP14	Alto Adige	≤ 2.5	100.3	246±15	95.5	730±32	0.337
AP15	Alto Adige	≤ 2.5	86.2	221±13	100	655±29	0.337
AP16	Via Machiavelli	≤ 2.5	100	217±12	100	618±27	0.352
AP17	Via Machiavelli	≤ 2.5	71.9	154±11	100	662±29	0.233
AP18	Via delle Sorgenti, Statte	≤ 10	88.5	193±12	95.1	647±28	0.299
AP19	Via delle Sorgenti, Statte	≤ 10	96.9	171±13	91.0	739±32	0.231
AP20	Via delle Sorgenti, Statte	≤ 10	90.8	265±16	100.9	986±42	0.268
AP21	Via delle Sorgenti, Statte	≤ 10	94.5	564±28	100	1038±44	0.543
AP22	San Vito	≤ 10	90.3	-	92.2	766±33	-
AP23	San Vito	≤ 10	70.5	399±23	76.7	1005±43	0.396
AP24	San Vito	≤ 10	97.5	475±23	100.4	1087±45	0.437
Mean±1SD		-	89.8±10.3	291±140	95.6±7.2	812±179	0.343±0.097
Range		-	70.5-100.3	154-564	76.7-100.9	618-1087	0.231-0.543