Erratum

Delft, 7 april 2025

Subject: Erratum Environmental Prices Handbook: EU27 version, version 1.1

In April 2025, CE Delft published a version 1.1. of the Environmental Prices Handbook 2024: EU version. In this version, a few corrections were done compared to version 1.0. The cause for the new version is a technical error that occurred in the valuation of human health, which has been corrected. Below, we show the old values, and the new ones resulting from the corrections. The version of the Handbook on our website and the website of Rijksoverheid.nl are the latest, correct version.

Valuation of human health

In version 1.0 of the handbook, a technical error occurred in the valuation of human health. We corrected this in version 1.1 of the handbook. This leads to changes in the prices that include effects on human health, both on pollutant level and at midpoint level. At midpoint level, the midpoints oxidant formation (human health), particulate matter formation, and NO_2-mortality (ReCiPe 2016) are affected. For acidification, a rounding error was corrected. For the PEF methodology the same applies: the prices for oxidant formation (human health) and particulate matter formation are corrected.

At pollutant level, the prices for the following emissions to air were corrected: $PM_{2.5}$, PM_{10}, Black carbon, NO_x, SO_2, NH_3, NMVOC, 1.3 Butadiene, benzene, 2-ethoxyethanol, 2-methoxyethanol, butane, cumene, ethanal, formaldehyde, isobutane, isoprene and trichloroethylene.

Midpoint level: old values

The affected environmental prices at midpoint level for ReCiPe 2016 and PEF, old values

Method	Midpoint	Lower	Central	Upper	Unit
ReCiPe 2016	Oxidant formation (human health)	€ 1.38	€ 2.17	€ 2.98	€/kg NO_x-eq.
ReCiPe 2016	Particulate matter formation	€ 61.7	€ 99.2	€ 138.1	€/kg $PM_{2.5}$-eq.
ReCiPe 2016	Acidification	€ 2.66	€ 5.27	€ 9.30	€/kg SO_2-eq.
ReCiPe 2016	NO_2-mortality	€ 4.31	€ 6.37	€ 9.62	€/kg NO_x-eq.
PEF	Oxidant formation (human health)	€ 1.04	€ 1.48	€ 2,04	€/kg NMVOC-eq.
PEF	Particulate matter formation	€ 538,733	€ 890,182	€ 1,267,004	€/Disease incidence

Midpoint level: new values

The affected environmental prices at midpoint level for ReCiPe 2016 and PEF, new values

Method	Midpoint	Lower	Central	Upper	Unit
ReCiPe 2016	Oxidant formation (human health)	€ 1.28	€ 1.86	€ 2.97	€/kg NO_x-eq.
ReCiPe 2016	Particulate matter formation	€ 58.5	€ 84.7	€ 138.1	€/kg $PM_{2,5}$-eq.
ReCiPe 2016	Acidification	€ 2.67	€ 5.28	€ 9.30	€/kg SO_2-eq.
ReCiPe 2016	NO_2-mortality	€ 4.02	€ 5.94	€ 8.90	€/kg NO_x-eq.
PEF	Oxidant formation (human health)	€ 0.98	€ 1.30	€ 2.03	€/kg NMVOC-eq.
PEF	Particulate matter formation	€ 511,307	€ 764,627	€ 1,266,826	€/Disease incidence

The values above, and therefore changes, are reported in the following tables in the handbook:

- Table 2, Summary, page 8;
- Table 7, Section 2.4.1, page 35-36;
- Table 8, Section 2.4.2, page 37;
- Table 9, Section 2.6.3, page 40 (practical example, adjusted calculations);
- Table 41, Section 6.5.8, page 139;
- Table 62, Section 7.2.3, page 167 (practical example, adjusted calculations);
- Table 63, Section 7.3.2, page 171.

Pollutant level: old and new values

At pollutant level, the table below shows an overview of the old and new values of the affected environmental prices.

Pollutant	Old values (€$_{2021}$/kg)			New values (€$_{2021}$/kg)		
	Lower	Central	Upper	Lower	Central	Upper
$PM_{2.5}$	58.5	95	134	55.4	81	134
PM_{10}	31.3	51.6	73.3	29.7	44.3	73.3
Black carbon	408	603	906	330	487	733
NO_x	13.5	21.5	31.8	12.8	19.3	31.8
SO_2	17.8	30.5	45.3	16.9	26.6	45.3
NH_3	18.2	28.7	39.5	17.4	25.2	39.5
NMVOC	1.62	2.49	3.49	1.53	2.16	3.49
1.3 Butadiene	1.4	2.01	2.88	1.4	1.91	2.87
Benzene	0.278	0.405	0.593	0.275	0.394	0.593
2-ethoxyethanol	0.325	0.455	0.625	0.312	0.414	0.623
2-methoxyethanol	0.588	0.851	1.23	0.578	0.818	1.23

Pollutant	Old values (€$_{2021}$/kg)			New values (€$_{2021}$/kg)		
	Lower	Central	Upper	Lower	Central	Upper
Butane	0.23	0.319	0.43	0.22	0.285	0.43
Cumene	0.246	0.342	0.463	0.235	0.306	0.462
Ethanal	1.79	2.6	3.83	1.77	2.5	3.83
Formaldehyde	0.491	0.694	0.967	0.474	0.642	0.965
Isobutane	0.208	0.288	0.388	0.198	0.257	0.387
Isoprene	1.19	1.69	2.35	1.15	1.56	2.35
Trichloroethylene	0.62	0.896	1.3	0.61	0.864	1.3

These prices are reported in various parts of the handbook:

- Table 1, Summary, page 8;
- Table 3, Section 2.3.1, page 32;
- Section 6.4.8, in text, page 130 (black carbon);
- Table 46, Section 6.7.7, page 146 (valuation of acidification at pollutant level, NO_x, rounding error);
- Table 60, Section 7.2.1, page 164;
- Table 61, Section 7.2.2, page 166;
- Table 79, Section F.2, page 237-243.

Moreover, tables that demonstrate the elements that lead to the environmental prices at pollutant level have been adjusted as well. These are given below (valuation of particulate matter formation at pollutant level, valuation of oxidant formation and nitrogen dioxides at pollutant level, and the differentiation for particulate matter at stack height and population density).

Damage costs due to particulate matter formation at pollutant level: old and new values

The average damage costs for emissions on the theme particulate matter formation was adjusted. These are for reporting purposes mostly.
NB: this table contained an error for black carbon, where the price for PM_{10} was mistakenly reported rather than the price for black carbon. These prices are reported in Table 35, Section 6.4.10, page 131.

Table 1 - Average damage costs for emissions in EU27 from an average emission source in 2015, in €$_{2021}$/kg on the theme particulate matter formation

	Old values (incorrect)			New values (correct)		
	Lower	Central	Upper	Lower	Central	Upper
$PM_{2.5}$^	€ 58.1	€ 94.0	€ 131.2	€ 55.0	€ 80.0	€ 131.2
PM_{10}^	€ 30.5	€ 49.3	€ 68.8	€ 28.9	€ 42.0	€ 68.8
SO_2	€ 16.3	€ 26.3	€ 36.8	€ 15.4	€ 22.4	€ 36.7
NO_x	€ 7.6	€ 12.3	€ 17.2	€ 7.2	€ 10.5	€ 17.2
NH_3	€ 14.4	€ 23.3	€ 32.5	€ 13.6	€ 19.8	€ 32.5
NVMOC^^	€ 1.3	€ 2.2	€ 3.0	€ 1.3	€ 1.8	€ 3.0
Black carbon (> 10% $PM_{2.5}$)*	€ 58.1	€ 94.0	€ 131.2	€ 330	€ 487	€ 733
Midpoint price $PM_{2.5}$-eq.	€ 61.7	€ 99.2	€ 138.2	€ 58.5	€ 84.7	€ 138.1

* For the fraction of black carbon greater than 10% of $PM_{2.5}$.

^ The harmfulness of PM_{10} is factored into the harmfulness of $PM_{2.5}$ and vice versa. Both damage estimates can therefore never be included at the same time.

^^ Harmfulness of secondary organic aerosols from NMVOC are measured at the topic of oxidant formation.

Damage costs due to oxidant formation and nitrogen dioxides: old and new values

The average damage costs for emissions on the theme oxidant formation and nitrogen dioxides were adjusted. These are for reporting purposes mostly. These prices are reported in Table 40, Section 6.5.8, page 139.

Table 2 - Environmental prices of emissions on the topic of oxidant formation including mortality, in €$_{2021}$/kg

	Old values			New values		
Pollutant	Lower	Central	Upper	Lower	Central	Upper
NO_x*	€ 4.77	€ 6.85	€ 10.7	€ 4.46	€ 6.40	€ 10.0
NMVOC	€ 1.62	€ 2.49	€ 3.53	€ 1.53	€ 2.16	€ 3.52
CO^	€ 0.0122	€ 0.0193	€ 0.0265	€ 0.0114	€ 0.0165	€ 0.0265
CH_4^	€ 0.0027	€ 0.0043	€ 0.0059	€ 0.0025	€ 0.0037	€ 0.0059
Formaldehyde**	€ 0.34	€ 0.47	€ 0.64	€ 0.33	€ 0.42	€ 0.64

* Including the harmful effects of nitrogen dioxides.

** Determined via valuation of the characterisation factor.

^ Only effects on human health.

Differentiation of particulate matter emissions: Old and new values

Due to the adjusted valuation of particulate matter, the differentiated values have also been adjusted. These values are reported in Table 36, Section 6.4.11, page 133.

Table 3 – Environmental prices differentiated by emission level (for particulate matter emissions) and population density, €$_{2021}$/kg for the central value (old and values)

Pollutant	Stack height	Old values Type of area (population density)			New values Type of area (population density)		
		Urban	Rural	Average	Urban	Rural	Average
$PM_{2.5}$	High	€ 59	€ 52	€ 49	€ 50	€ 44	€ 42
	Low	€ 76	€ 62	€ 64	€ 65	€ 53	€ 54
	Ambient	€ 217	€ 116	€ 182	€ 185	€ 99	€ 155
	Average	€ 114	€ 75	€ 95	€ 97	€ 64	€ 81
PM_{10}	High	€ 37	€ 26	€ 31	€ 32	€ 22	€ 26
	Low	€ 52	€ 33	€ 41	€ 44	€ 28	€ 35
	Ambient	€ 142	€ 80	€ 108	€ 122	€ 69	€ 92
	Average	€ 66	€ 40	€ 52	€ 56	€ 35	€ 44
SO_2	Average	€ 34	€ 28	€ 31	€ 30	€ 24	€ 27
NO_x	Average	€ 23	€ 21	€ 22	€ 21	€ 19	€ 19
NH_3	Average	€ 29	€ 29	€ 29	€ 25	€ 25	€ 25

Environmental prices for noise (the Netherlands only)

The estimations of the damage cost of noise exposure for the Netherlands, reported in the Environmental Prices Handbook 2024: EU version in Annex D.7, have been corrected. Here, it concerns the method to calculate the average damage cost per bin of 5 dB(A). Before, a simple average was calculated of the total costs per 1 dB(A) bin to generate the average per 5 dB(A) bin. In reality, the average noise exposure is closer to the lower side of each 5 dB(A) bin (around 1.8 dB(A) above the lower value). The average values have therefore been adjusted, in order to reflect this insight.

Old values

The values are reported in the handbook in Annex D.7, pages 230-231.

Table 4 - Old environmental prices for road traffic noise exposure, in €$_{2021}$ per person per year for the Netherlands

Noise class (dB(A) Lden)	Lower value	Central value	Upper value
40-45	–	–	–
45-50	–	€ 51	€ 68
50-55	€ 93	€ 201	€ 248
55-60	€ 313	€ 439	€ 517
60-65	€ 620	€ 765	€ 875

Noise class (dB(A) Lden)	Lower value	Central value	Upper value
65-70	€ 1,015	€ 1,180	€ 1,323
70-75	€ 1,498	€ 1,683	€ 1,861
75-80	€ 2,069	€ 2,276	€ 2,489
80+	€ 2,450	€ 2,670	€ 2,906

Table 5 - Old environmental prices for noise exposure from rail traffic, in €$_{2021}$ per person per year for the Netherlands

Noise class (dB(A) Lden)	Lower value	Central value	Upper value
40-45	–	–	€ 11
45-50	–	€ 52	€ 78
50-55	€ 93	€ 188	€ 215
55-60	€ 298	€ 393	€ 420
60-65	€ 572	€ 667	€ 694
65-70	€ 914	€ 1,009	€ 1,036
70-75	€ 1,325	€ 1,421	€ 1,447
75-80	€ 1,805	€ 1,900	€ 1,927
80+	€ 2,123	€ 2,218	€ 2,245

Table 6 - Old environmental prices for noise exposure from air traffic, in €$_{2021}$ per person per year for the Netherlands

Noise class (dB(A) Lden)	Lower value	Central value	Upper value
40-45	–	–	24
45-50	–	€ 121	€ 183
50-55	€ 220	€ 445	€ 506
55-60	€ 708	€ 933	€ 994
60-65	€ 1,361	€ 1,585	€ 1,647
65-70	€ 2,179	€ 2,403	€ 2,465
70-75	€ 3,161	€ 3,386	€ 3,447
75-80	€ 4,309	€ 4,533	€ 4,595
80+	€ 5,069	€ 5,294	€ 5,355

New values

Table 7 - New environmental prices for road traffic noise exposure, in €$_{2021}$ per person per year for the Netherlands

Noise class (dB(A) Lden)	Lower value	Central value	Upper value
40-45	-	-	-
45-50	-	€ 25	€ 35
50-55	€ 50	€ 153	€ 193
55-60	€ 249	€ 370	€ 441
60-65	€ 535	€ 675	€ 777
65-70	€ 909	€ 1,069	€ 1,204
70-75	€ 1,371	€ 1,551	€ 1,721
75-80	€ 1,921	€ 2,122	€ 2,327
80+	€ 2,450	€ 2,670	€ 2,906

Table 8 - New environmental prices for noise exposure from rail traffic, in €$_{2021}$ per person per year for the Netherlands

Noise class (dB(A) Lden)	Lower value	Central value	Upper value
40-45	-	-	€ 2
45-50	-	€ 27	€ 53
50-55	€ 51	€ 147	€ 173
55-60	€ 240	€ 335	€ 362
60-65	€ 497	€ 593	€ 619
65-70	€ 823	€ 918	€ 945
70-75	€ 1,218	€ 1,313	€ 1,340
75-80	€ 1,681	€ 1,776	€ 1,803
80+	€ 2,123	€ 2,218	€ 2,245

Table 9 - New environmental prices for noise exposure from air traffic, in €$_{2021}$ per person per year for the Netherlands

Noise class (dB(A) Lden)	Lower value	Central value	Upper value
40-45	-	-	€ 4
45-50	-	€ 62	€ 124
50-55	€ 122	€ 346	€ 408
55-60	€ 570	€ 794	€ 856
60-65	€ 1,183	€ 1,408	€ 1,469

Noise class (dB(A) Lden)	Lower value	Central value	Upper value
65-70	€ 1,961	€ 2,186	€ 2,247
70-75	€ 2,904	€ 3,129	€ 3,190
75-80	€ 4,012	€ 4,236	€ 4,298
80+	€ 5,069	€ 5,294	€ 5,355