

Adjustment DE-A regarding NO_x from Road Vehicles

PREFACE

When deriving proposals for national emission ceilings for negotiations of the 1999 Gothenburg Protocol, sector-specific emission estimates for the year 2010 were calculated at IIASA using a set of scenarios which assumed various technological abatement measures, policy incentives, and legislation available / in place or planned at that time. As a result, the 2010 emission by road transport in Germany was estimated at NO_x (IIASA, 1999) ¹⁾. The over-all 2010 national emission ceiling (NEC) for NO_x was set to 1,081 kt. When negotiating the EU NEC Directive two years later, Germany agreed to reduce its NO_x emissions further, resulting in a NEC of 1,051 kt.

In its 2016 NEC emissions reporting, Germany provided a national total for NO_x emissions of 1,337 kt for 2010. However, this total includes emissions from agricultural soils and other source categories not accounted for when setting the NEC. In addition, some assumptions made in 1999, including on emission factors from road traffic, turned out to be wrong in reality. Like in many other European countries, non-compliance with the 2010 NEC as set in 1999 was partly not caused by failed national mitigation policies, but by changes beyond the control of, and unforeseen by, the individual Party or Member State.

In order to differentiate such changes from policy failures in the responsibility of the individual Parties to the Gothenburg Protocol, a procedure (Inventory Adjustment) allowing the adjustment of emissions resulting from new emission categories, changes in estimation methodologies, emission factors etc. provided within the EMEP/EEA Guidebook, or other effects beyond national control with respect to complying to emission reduction obligations (EB, 2012 a & c) ^{2), 3)} was agreed. This procedure is applicable also for existing NECs (EB, 2012b) ⁴⁾.

With respect to road transport, such an unforeseeable effect was the partial failure of several so-called “Euro norms” set on the EU level to reduce emissions from road vehicles. In this report, Germany presents an estimate of the NO_x emissions resulting from the partial failure of the mitigation policy reflected by the Euro norms, and lays out the calculations leading to these estimates.

REASONS FOR MISSING THE GOTHENBURG CEILINGS

The TREMOD methodology applied for estimating emissions from road transportation in Germany has changed over time. These changes include updates of emission factors (EF) for various pollutants and other changes such as an extension of vehicle classification (and thus inclusion of emission factors associated with these new vehicle sub-categories) to improve the estimation's accuracy.

The main changes occurred for the emission factors and for the Heavy Duty Vehicles (HDV) fleet structure. This last point led to changes in emissions because of the reallocation of activities (consumption/traffic) between the sub-categories of vehicles.

For the formalism of the adjustments, it is difficult to flag whether the modifications for road transport are due to “methodological changes” or due to “changes of emission factor”. Therefore, only the term “change of methodology” will be used (even if at the NFR reporting level this may seem like a simple change in EFs).

So far as road transport is concerned, the inability to attain the emission ceiling is most likely to have been affected by a combination of technological changes within the fleet (which of course made their way into the several versions of TREMOD) combined with greater than originally expected dieselisation of the fleet.

ANALYSING THE PROBLEM: THE EUROPEAN PERSPECTIVE BASED ON COPERT

Already in 2011, these effects were demonstrated by Ntziachristos and Papageorgiou (2011) ⁵⁾. Here, the impacts of changing model versions and activity data in the context of meeting the EU NEC Directive ceiling commitments were examined for four European countries including Germany. Unfortunately, this comparison study was carried out within a COPERT environment. Therefore, the results gained cannot be transferred to the German TREMOD environment on a one-to-one level but nonetheless allow a highly illustrative insight in the reasons for not meeting the set ceiling. The study modeled fuel consumption and NO_x emissions for four selected countries (Germany, France, Netherlands and Belgium) and found higher NO_x emissions were estimated for the road transport sector than originally modelled by the RAINS model of IIASA (which underpinned the setting of 2010 ceilings). For Germany, this study shows that with the same activity data set (LIFE+

EC4MACS data from Amann et al. (2010)), NO_x emissions estimated with COPERT II vs. COPERT 4 (v8.0) increase from 410 kt to 518 kt due to methodological changes, a difference of 282 kt. An additional consideration of changes in AD would lead to 620 kt of NO_x. However, as changes in AD are no valid adjustment reason, the latter value is for information only.

This was mainly due to: * NO_x “artificial” current emissions = virtual current emissions assuming no changes in emission factors emission factors updated in COPERT 4 that did not follow the reductions as set by the emission standards for diesel passenger cars; * important part of diesel fuel consumption in the total fuel consumption of the road traffic.

The results of this study showed that it is the combination of different parameters which might affect the ability (to different extents) of a Party to attain the emission ceilings. In other words, the exceeding of NO_x ceilings for road transport is due to:

Changes in methodology and emission factors

As these technologically driven changes (as reflected in the evolution of the different so-called Euro norms) lie outside the country's responsibility, current methodology and EFs have to be adjusted in a way to allow the comparison of the actual inventory and the Gothenburg ceilings.

Changes in the activity data

As the development of mileage driven and fuels used within a country (Germany: stronger dieselisation then originally expected) is of the country's responsibility, this effect has to be excluded from any adjustment estimation.

IN-COUNTRY ANALYSIS: THE TREMOD PERSPECTIVE

INITIAL ASSUMPTION

In order to estimate the effect of NO_x emissions resulting from the failure of the so-called Euro norms, the following procedure has been agreed by expert review teams in the last two years:



proposed amount of adjustable emissions = current AD x current EF - current AD x original EF = current AD x (current EF - original EF)
= current EM - “artificial” current EM¹

¹ “artificial” current emissions = virtual current emissions assuming no changes in emission factors



$$\begin{aligned} EM_{\text{adjustment}} &= AD_{\text{current}} * EF_{\text{current}} - AD_{\text{current}} * EF_{\text{original}} \\ &= AD_{\text{current}} * (EF_{\text{current}} - EF_{\text{original}}) \\ &= EM_{\text{current}} - EM_{\text{current "artificial"}} \end{aligned}$$

with

- **EM „adjustment,,** = amount of emissions to be subtracted from National Totals
- **AD „current,,** = AD from latest TREMOD version as used for current submission
- **EF „current,,** = EF from latest TREMOD version as used for current submission
- **EF „original,,** = EF from TREMOD version used at the time NEC ceilings were set (here: TREMOD 3.1)
- **EM „current,,** = EM estimated from AD and EF from latest TREMOD version = EM reported for NFR 1.A.3.b with latest submission
- **EM „current-“artificial”,,** = EM estimated from AD from latest TREMOD version and EF from TREMOD version used at the time NEC ceilings were set (here: TREMOD 3.1)

APPLYING THE ORIGINAL METHODOLOGY

FRAMEWORK INFORMATION

The methodology used for estimating Germany's exhaust emissions from road transport when determining emissions ceilings of the Gothenburg Protocol (1999), was the second version of the EMEP/CORINAIR guidebook corresponding to COPERT II software. This method proposed NO_x emission factors for

- passenger cars (PC): up to Euro 1
- light commercial vehicles (LCV2): up to Euro 1
- heavy duty vehicles (HDV): pre-EURO I only (conventional)

Back then, without better knowledge, the emission factors for the most recent standards were derived by directly applying the expected reductions in emission standards.

However, as Germany does not use COPERT for compiling its road transport emissions inventory but a national model called TREMOD, the following comparison has to be carried out between the oldest version of TREMOD still available and the version as applied for the current inventory submission (2021).

Unfortunately, the oldest TREMOD version available for such comparison is TREMOD 3.1 from 2002 ⁶⁾, including the following set of NO_x emission factors:

- passenger cars (PC): up to Euro 4
- light commercial vehicles (LCV): up to Euro 4
- heavy duty vehicles (HDV) only up to EURO V

However, as this version includes the technological development since 1999 (when the ceilings were set based on COPERT II), the results from this analysis and the adjustment proposal based upon these results are likely to slightly underestimate the effect of technological changes since 1999 and must therefore be considered conservative.

THE COMPARISON

Application of the original NO_x methodology to the current road transport background activity data

The *basic activity data* (such as over-all fuel sold and traffic mileages by vehicle type, by fuel or by Euro regulation) implemented in TREMOD 3.1 differ significantly from those of the current TREMOD version especially for the more recent years as of 2005. In addition, *specific activity data* (such as fuel consumptions per vehicle type, per fuel or per Euro regulation) strongly depend on the TREMOD version.

Within this report, Germany re-estimates the NO_x emission within the TREMOD 3.1 model. To isolate the requested information, the original TREMOD 3.1 activity data was combined with emission factors from both TREMOD 3.1 and the currently used TREMOD 6.12 (Knörr et al., 2020a) ⁷⁾.

Description of the updated methodology used

The updated methodology, used in 2019 (for NFR submission 2021) and implemented in version 6.12 of the TREMOD software, considers emission factors of

- passenger cars (PC) up to Euro 6d
- light commercial vehicles (LCV) up to Euro 6d
- heavy duty vehicles (HDV) up to EURO VI

and

- motorized two-wheelers (M2W) up to Euro 4

Comparison of emission estimates made using the original and updated methodologies

The values of NO_x emissions presented in the table below are estimated with:

- TREMOD 3.1 model equations as initial methodology

and ,

- TREMOD 6.12 equations as methodology applied for NEC submission 2021.

The activity data applied to initial (here: oldest available) and most recent methodology, are those of the latest inventory provided with NEC submission 2021.

Table 1: Resulting adjustment proposal 2020

for year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
proposed adjustment	-296.1	-300.7	-300.4	-305.2	-294.9	-274.9	-250.9	-221.1	-179.6	-144.8

The following screenshots show the TREMOD 3.1 / TREMOD 6.12 implementation comparisons per vehicle type/fuel/Euro regulation.

Activity Data

- **current:** from TREMOD 6.12, as reported with the latest inventory submission
- **adjusted:** has to be similar to **current** AD!
- **difference:** as only recent AD are to be used for adjustment estimations, this value must be zero!

Implied Emission Factor

- **current:** representing the ratio of current emissions and current AD
- **adjusted:** representing the ratio of adjusted emissions and current AD
- **difference:** shows percentual difference

NO_x Emissions

- **current:** from TREMOD 6.12, as reported with the latest inventory submission
- **adjusted:** estimated based on TREMOD 3.1 methodology and TREMOD 6.12 AD
- **adjustment:** adjusted emissions minus current emissions
- **difference:** percentual difference between current and adjusted emissions

Adjustment overview for years 2010 to 2019

NFR Code	Fuel	Year	Activity Data			Implied Emission Factor			NO _x Emissions			
			current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	difference
			in [TJ]		in [%]	in [kg/TJ]		in [%]		in [kg]		in [%]
1.A.3.b.i	gasoline		795.957	795.957	0%	97.55	84.99	-13%	77.644.842	67.690.906	9.953.935	-13%
1.A.3.b.i	diesel oil		629.380	629.380	0%	429.45	160.51	-63%	227.341.096	84.970.461	142.370.635	-63%
1.A.3.b.ii	gasoline		6.325	6.325	0%	255.87	214.75	-16%	1.618.432	1.358.328	260.104	-16%
1.A.3.b.ii	diesel oil		113.450	113.450	0%	476.34	134.96	-72%	54.040.533	15.311.584	38.728.949	-72%
1.A.3.b.iii	gasoline		48.844	48.844	0%	823.00	482.55	-42%	29.931.266	23.183.732	6.747.534	-23%
1.A.3.b.iii	diesel oil		566.741	566.741	0%	446.67	271.83	-39%	253.148.243	154.056.160	99.092.083	-39%
1.A.3.b.iv	gasoline		19.712	19.712	0%	113.68	168.43	48%	2.240.749	3.320.034	-1.079.285	48%
1.A.3.b TOTAL	2010		2.079.608	2.079.608	0%			0%	645.965.162	349.851.206	296.113.956	-40%
1.A.3.b.i	gasoline		794.688	794.688	0%	92.09	81.61	-11%	73.185.851	64.851.951	8.333.900	-11%
1.A.3.b.i	diesel oil		553.564	553.564	0%	434.12	159.22	-63%	240.313.791	88.138.909	152.174.832	-63%
1.A.3.b.ii	gasoline		6.118	6.118	0%	229.35	198.57	-13%	1.403.081	1.214.776	188.305	-13%
1.A.3.b.ii	diesel oil		115.967	115.967	0%	481.55	126.92	-74%	55.844.518	14.718.142	41.126.376	-74%
1.A.3.b.iii	gasoline		47.355	47.355	0%	592.65	448.99	-24%	28.071.221	21.268.323	6.804.898	-24%
1.A.3.b.iii	diesel oil		563.891	563.891	0%	410.38	244.97	-40%	231.410.271	138.135.342	93.273.929	-40%
1.A.3.b.iv	gasoline		19.289	19.289	0%	110.79	171.60	54%	2.137.002	3.299.162	-1.162.160	54%
1.A.3.b TOTAL	2011		2.106.883	2.106.883	0%			0%	632.365.736	331.625.695	300.740.041	-48%
1.A.3.b.i	gasoline		750.957	750.957	0%	85.73	78.00	-9%	64.379.994	58.677.229	5.802.765	-9%
1.A.3.b.i	diesel oil		555.245	555.245	0%	435.96	158.66	-64%	242.062.902	88.096.699	153.966.203	-64%
1.A.3.b.ii	gasoline		5.657	5.657	0%	218.93	193.15	-12%	1.238.520	1.092.662	145.859	-12%
1.A.3.b.ii	diesel oil		114.350	114.350	0%	481.91	128.17	-75%	55.106.362	13.741.354	41.365.028	-75%
1.A.3.b.iii	gasoline		50.902	50.902	0%	533.22	384.33	-28%	27.141.913	19.563.200	7.578.704	-28%
1.A.3.b.iii	diesel oil		589.585	589.585	0%	381.33	224.00	-41%	234.829.180	132.064.753	102.764.428	-41%
1.A.3.b.iv	gasoline		18.268	18.268	0%	107.43	173.28	61%	1.962.546	3.165.439	-1.202.893	61%
1.A.3.b TOTAL	2012		2.084.964	2.084.964	0%			0%	616.721.438	316.391.343	300.429.094	-49%
1.A.3.b.i	gasoline		749.114	749.114	0%	89.35	74.85	-7%	60.190.007	56.071.797	4.118.211	-7%
1.A.3.b.i	diesel oil		589.131	589.131	0%	437.14	158.71	-64%	257.633.728	93.499.010	164.134.718	-64%
1.A.3.b.ii	gasoline		5.578	5.578	0%	202.80	184.07	-9%	1.131.209	1.026.727	104.482	-9%
1.A.3.b.ii	diesel oil		118.777	118.777	0%	480.60	114.93	-76%	57.083.533	13.690.488	43.433.045	-76%
1.A.3.b.iii	gasoline		51.716	51.716	0%	509.64	368.06	-29%	26.350.969	18.620.843	7.730.126	-29%
1.A.3.b.iii	diesel oil		600.139	600.139	0%	353.06	287.93	-19%	211.887.531	124.788.469	87.099.062	-41%
1.A.3.b.iv	gasoline		18.229	18.229	0%	104.34	175.38	68%	1.902.688	3.197.038	-1.294.351	68%
1.A.3.b TOTAL	2013		2.132.683	2.132.683	0%			0%	616.079.063	316.854.371	300.224.692	-50%
1.A.3.b.i	gasoline		752.526	752.526	0%	76.03	73.09	-4%	57.215.533	54.988.921	2.216.612	-4%
1.A.3.b.i	diesel oil		626.845	626.845	0%	435.87	159.12	-63%	272.876.061	95.613.892	173.262.169	-63%
1.A.3.b.ii	gasoline		5.845	5.845	0%	190.34	176.49	-7%	1.112.584	1.031.612	80.972	-7%
1.A.3.b.ii	diesel oil		128.578	128.578	0%	475.56	110.96	-77%	61.546.575	14.267.237	46.879.338	-77%
1.A.3.b.iii	gasoline		49.143	49.143	0%	468.37	339.99	-27%	23.017.115	16.708.234	6.308.881	-27%
1.A.3.b.iii	diesel oil		572.754	572.754	0%	314.05	196.05	-38%	179.874.133	112.285.582	67.588.551	-38%
1.A.3.b.iv	gasoline		18.673	18.673	0%	100.59	179.24	78%	1.878.294	3.345.794	-1.467.499	78%
1.A.3.b TOTAL	2014		2.153.563	2.153.563	0%			0%	597.120.297	302.252.271	294.868.025	-49%
1.A.3.b.i	gasoline		715.156	715.156	0%	74.38	71.73	-4%	53.190.787	51.300.983	1.889.805	-4%
1.A.3.b.i	diesel oil		645.555	645.555	0%	426.19	159.80	-63%	275.130.233	103.163.501	171.966.732	-63%
1.A.3.b.ii	gasoline		5.793	5.793	0%	187.12	172.80	-8%	1.083.927	1.000.999	82.928	-8%
1.A.3.b.ii	diesel oil		135.386	135.386	0%	489.35	187.96	-77%	63.605.443	14.607.490	48.997.953	-77%
1.A.3.b.iii	gasoline		52.287	52.287	0%	458.96	327.99	-29%	23.997.817	17.149.448	6.848.370	-29%
1.A.3.b.iii	diesel oil		589.411	589.411	0%	266.69	187.51	-30%	157.189.675	110.620.703	46.568.973	-30%
1.A.3.b.iv	gasoline		18.459	18.459	0%	99.32	189.65	82%	1.833.362	3.334.472	-1.501.090	82%
1.A.3.b TOTAL	2015		2.161.376	2.161.376	0%			0%	575.931.265	301.877.596	274.053.670	-48%
1.A.3.b.i	gasoline		715.272	715.272	0%	79.93	76.65	-4%	50.736.367	50.535.049	201.318	0%
1.A.3.b.i	diesel oil		675.119	675.119	0%	410.36	160.76	-61%	277.041.660	108.535.230	168.506.430	-61%
1.A.3.b.ii	gasoline		5.926	5.926	0%	180.27	171.05	-5%	1.068.292	1.013.678	54.614	-5%
1.A.3.b.ii	diesel oil		144.068	144.068	0%	456.12	185.62	-77%	65.712.732	15.216.007	50.496.725	-77%
1.A.3.b.iii	gasoline		54.157	54.157	0%	424.73	388.24	-7%	23.002.109	16.683.117	6.308.992	-27%
1.A.3.b.iii	diesel oil		594.013	594.013	0%	226.31	180.97	-20%	134.431.699	107.496.262	26.935.437	-20%
1.A.3.b.iv	gasoline		18.785	18.785	0%	95.14	181.66	89%	1.805.897	3.412.476	-1.606.579	89%
1.A.3.b TOTAL	2016		2.207.339	2.207.339	0%			0%	553.790.558	302.901.820	250.897.738	-45%
1.A.3.b.i	gasoline		724.571	724.571	0%	67.66	69.88	3%	49.026.074	50.634.714	-1.607.640	3%
1.A.3.b.i	diesel oil		696.592	696.592	0%	390.65	161.95	-59%	272.126.091	112.810.721	159.315.370	-59%
1.A.3.b.ii	gasoline		6.186	6.186	0%	171.15	167.18	-2%	1.058.799	1.034.211	24.588	-2%
1.A.3.b.ii	diesel oil		153.284	153.284	0%	424.66	183.89	-76%	65.093.930	15.925.216	49.168.714	-76%
1.A.3.b.iii	gasoline		53.382	53.382	0%	379.80	286.71	-23%	19.793.901	15.304.828	4.489.073	-23%
1.A.3.b.iii	diesel oil		596.263	596.263	0%	195.02	175.92	-10%	116.671.141	106.246.508	11.424.633	-10%
1.A.3.b.iv	gasoline		19.160	19.160	0%	92.83	183.39	98%	1.778.674	3.513.787	-1.735.114	98%
1.A.3.b TOTAL	2017		2.251.437	2.251.437	0%			0%	525.549.410	304.469.986	221.079.424	-42%
1.A.3.b.i	gasoline		699.027	699.027	0%	64.42	68.36	6%	45.032.966	47.786.817	-2.753.820	6%
1.A.3.b.i	diesel oil		666.074	666.074	0%	371.66	163.30	-56%	247.556.063	108.768.604	138.787.459	-56%
1.A.3.b.ii	gasoline		6.315	6.315	0%	158.22	160.11	1%	999.199	1.011.138	-11.939	1%
1.A.3.b.ii	diesel oil		154.259	154.259	0%	384.71	182.69	-73%	59.344.525	15.840.310	43.504.215	-73%
1.A.3.b.iii	gasoline		51.634	51.634	0%	309.75	263.53	-15%	15.993.526	13.607.106	2.386.420	-15%
1.A.3.b.iii	diesel oil		585.186	585.186	0%	171.18	172.10	1%	180.173.337	180.710.869	-537.532	1%
1.A.3.b.iv	gasoline		18.497	18.497	0%	89.66	184.61	106%	1.658.588	3.414.767	-1.756.209	106%
1.A.3.b TOTAL	2018		2.180.993	2.180.993	0%			0%	478.758.206	291.139.612	179.618.593	-39%
1.A.3.b.i	gasoline		704.691	704.691	0%	62.30	68.45	10%	43.901.941	48.238.025	-4.336.084	10%
1.A.3.b.i	diesel oil		663.841	663.841	0%	345.81	165.07	-52%	229.566.088	109.582.982	119.983.106	-52%
1.A.3.b.ii	gasoline		6.683	6.683	0%	146.08	153.25	5%	976.219	1.034.150	-57.931	5%
1.A.3.b.ii	diesel oil		159.183	159.183	0%	347.42	181.90	-71%	55.303.535	16.221.445	39.082.090	-71%
1.A.3.b.iii	gasoline		52.939	52.939	0%	274.41	247.81	-10%	14.527.012	13.118.578	1.408.434	-10%
1.A.3.b.iii	diesel oil		595.913	595.913	0%	153.35	169.17	10%	91.380.700	106.809.376	-15.428.676	10%
1.A.3.b.iv	gasoline		18.750	18.750	0%	86.05	186.83	117%	1.613.450	3.502.941	-1.889.491	117%
1.A.3.b TOTAL	2019		2.202.899	2.202.899	0%			0%	437.268.744	292.497.697	144.771.048	-33%

Adjustment details for 2020

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	difference		
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [kg]	in [kg]	in [kg]		
1.A.3.a.i. Passenger Cars	Gasoline	pre-Cars	13,686	13,686	0%	584.75	514.25	-12%	7,955,060	6,996,917	-958,143	
		Car 1	36,541	36,541	0%	338.50	297.71	-10%	25,915,925	19,189,262	-7,716,663	
		Car 2	96,425	96,425	0%	172.95	135.63	-22%	16,580,020	13,020,026	-3,559,994	
		Car 3	133,139	133,139	0%	58.51	70.18	20%	7,790,384	9,343,433	1,553,049	
		Car 4	444,991	444,991	0%	42.27	42.19	0%	18,911,389	18,773,529	-137,859	
		Car 5	31,234	31,234	0%	18.61	42.19	127%	581,142	1,317,737	736,595	
	Car 6	0	0	0%	25.08	42.19	62%	2	3	1		
	Gasoline total	795,957	795,957	0%	92.55	84.99	-8%	77,646,642	67,656,596	-9,990,045		
	Diesel Oil	pre-Cars	1,915	1,915	0%	318.13	264.95	-17%	583,760	527,256	-56,504	
		Car 1	10,339	10,339	0%	294.42	245.17	-17%	3,044,428	2,741,387	-303,041	
Car 2		50,088	50,088	0%	406.90	279.19	-30%	29,372,795	19,974,210	-9,398,584		
Car 3		134,025	134,025	0%	542.54	176.54	-67%	72,645,173	23,929,276	-48,715,897		
1.A.3.b.i. Light Duty Vehicles (LDVs)	Gasoline	Car 4	279,154	279,154	0%	304.37	140.58	-53%	167,299,180	39,243,811	-128,055,369	
		Car 5	53,547	53,547	0%	434.70	140.58	-68%	23,276,735	7,527,796	-15,748,939	
		Car 6	334	334	0%	257.62	140.58	-45%	85,044	46,553	-38,491	
		Diesel oil total	529,380	529,380	0%	429.45	160.55	-63%	227,347,096	84,970,461	-142,376,635	
		Pkx Total	1,325,337	1,325,337	0%	238.12	155.14	-36%	364,985,938	152,627,057	-212,358,881	
		Diesel Oil	pre-Cars	1,249	1,249	0%	627.99	640.95	1%	783,320	904,871	121,551
	Car 1		367	367	0%	361.95	297.39	-19%	364,969	186,620	-178,349	
	Car 2		1,393	1,393	0%	264.75	184.41	-30%	368,840	256,917	-111,923	
	Car 3		856	856	0%	82.47	30.83	-63%	70,631	77,625	6,994	
	1.A.3.b.ii. Heavy Duty Vehicle Buses	Gasoline	Car 4	2,420	2,420	0%	36.32	44.90	24%	87,967	188,679	100,712
Car 5			49	49	0%	15.34	44.90	193%	750	2,218	1,468	
Car 6			0	0	0%	0	0	0%	0	0	0	
Gasoline total			6,345	6,345	0%	255.87	254.75	-0%	1,419,832	1,358,126	-61,706	
Diesel Oil			pre-Cars	4,876	4,876	0%	425.99	386.79	-9%	2,077,142	1,436,983	-640,159
			Car 1	9,989	9,989	0%	398.18	276.24	-30%	2,389,095	1,289,636	-1,099,459
		Car 2	13,126	13,126	0%	336.76	153.18	-54%	4,420,260	2,534,731	-1,885,529	
		Car 3	33,249	33,249	0%	531.91	150.58	-72%	17,655,883	5,086,760	-12,569,123	
1.A.3.b.iii. Heavy Duty Vehicle Trucks & Lorries		Gasoline	Car 4	54,581	54,581	0%	491.42	80.69	-84%	26,021,036	4,940,722	-21,080,314
			Car 5	1,629	1,629	0%	427.50	80.69	-79%	696,296	144,434	-551,862
	Car 6		0	0	0%	15.73	80.69	42%	7	4	-3	
	Diesel oil total		113,450	113,450	0%	476.34	134.94	-72%	54,043,533	15,351,584	-38,691,949	
	LDVs Total		119,775	119,775	0%	464.70	139.18	-70%	55,658,966	16,685,953	-38,973,013	
	Diesel Oil		pre-Cars	3,382	3,382	0%	1096.25	1028.78	-6%	3,674,067	3,432,644	-241,423
		Car 1	2,826	2,826	0%	749.41	732.14	-2%	2,117,871	2,125,595	7,723	
		Car 2	10,152	10,152	0%	801.96	643.47	-20%	8,140,119	6,532,213	-1,607,906	
		Car 3	15,090	15,090	0%	633.22	437.25	-30%	10,065,776	7,269,299	-2,796,477	
	1.A.3.b.iv. Heavy Duty Vehicle Trucks & Lorries	Gasoline	Car 4	5,461	5,461	0%	448.63	351.65	-22%	2,650,016	1,921,527	-728,489
Car 5			10,326	10,326	0%	337.28	182.33	-46%	3,882,417	1,882,644	-1,999,773	
Car 6			0	0	0%	0	0	0%	0	0	0	
Buses Total			48,044	48,044	0%	623.80	482.55	-23%	29,931,266	23,183,732	-6,747,534	
Diesel Oil			pre-Cars	10,185	10,185	0%	1040.16	787.37	-25%	10,510,623	7,754,136	-2,756,487
			Car 1	5,677	5,677	0%	758.59	575.55	-24%	4,261,383	3,267,681	-993,702
		Car 2	38,558	38,558	0%	817.62	524.79	-35%	31,525,526	20,234,619	-11,290,907	
		Car 3	169,023	169,023	0%	636.26	274.48	-57%	161,136,182	59,617,271	-101,518,911	
1.A.3.b.v. Motorized Two-Wheelers (M2Ws)		Gasoline	Car 4	69,636	69,636	0%	368.34	290.62	-21%	27,183,867	20,146,636	-7,037,231
			Car 5	283,934	283,934	0%	276.42	151.65	-45%	78,643,643	43,115,897	-35,527,746
	Car 6		0	0	0%	0	0	0%	0	0	0	
	Trucks Total		565,741	565,741	0%	446.67	271.83	-39%	293,148,243	154,696,160	-138,452,083	
	Diesel Oil		pre-Cars	7,973	7,973	0%	122.80	149.18	22%	972,721	1,189,393	216,672
			Car 1	5,231	5,231	0%	123.77	165.74	34%	647,479	887,039	239,560
		Car 2	3,587	3,587	0%	141.16	184.21	30%	585,362	696,661	111,299	
		Car 3	2,950	2,950	0%	38.11	184.21	387%	116,189	567,032	450,843	
	1.A.3.b.vi. Motorized Two-Wheelers (M2Ws)	Gasoline	Car 4	0	0	0%	0	0	0%	0	0	0
			Car 5	0	0	0%	0	0	0%	0	0	0
M2Ws Total			79,712	79,712	0%	113.68	168.23	48%	2,243,149	3,326,034	1,082,885	
Diesel Oil			Total	2,879,688	2,879,688	0%	219.62	168.23	-46%	645,965,162	349,851,296	-296,113,866

Adjustment details for 2023

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	difference	
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [kg]	in [kg]	in [kg]	in [%]	
1.A.3.a.i. Passenger Cars	Gasoline	pre-Cars	11,581	11,581	0%	607.72	635.38	-52%	7,026,041	6,189,785	-836,256	-52%
		Car 1	47,487	47,487	0%	348.56	281.60	-31%	16,571,746	11,426,129	-5,145,617	-31%
		Car 2	72,781	72,781	0%	184.27	137.92	-25%	13,487,749	10,035,380	-3,452,369	-25%
		Car 3	189,443	189,443	0%	63.89	72.62	14%	6,927,963	7,875,172	947,209	14%
		Car 4	489,541	489,541	0%	45.39	45.13	-1%	18,541,881	18,436,736	-105,145	-1%
		Car 5	181,961	181,961	0%	18.61	45.13	142%	1,887,355	4,681,311	2,793,956	142%
	Car 6	282	282	0%	25.05	45.13	74%	7,339	12,735	5,396	74%	
	Gasoline total	750,957	750,957	0%	85.73	78.89	-9%	64,379,964	58,577,229	-5,802,735	-9%	
	Diesel Oil	pre-Cars	1,487	1,487	0%	311.98	284.56	-9%	463,963	383,872	-80,091	-9%
		Car 1	6,660	6,660	0%	267.79	246.44	-11%	1,980,364	1,771,787	-208,577	-11%
		Car 2	33,957	33,957	0%	406.82	279.27	-40%	13,887,432	7,445,646	-6,441,787	-40%
		Car 3	183,539	183,539	0%	564.82	176.63	-69%	58,389,037	18,434,837	-39,954,200	-69%
		Car 4	234,943	234,943	0%	398.41	146.46	-62%	91,724,190	34,488,997	-57,235,193	-62%
		Car 5	173,112	173,112	0%	434.89	146.46	-66%	75,284,364	25,353,375	-49,930,989	-66%
Car 6	1,557	1,557	0%	219.84	146.46	-44%	484,664	220,095	-264,569	-44%		
Diesel oil total	555,245	555,245	0%	455.96	158.66	-64%	242,962,982	88,096,639	-154,866,343	-64%		
FCs Total	1,306,202	1,306,202	0%	234.67	152.29	-54%	386,442,896	186,673,567	-199,769,329	-54%		
1.A.3.b.i. Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	962	962	0%	632.38	645.95	2%	607,779	621,146	13,417	2%
		Car 1	232	232	0%	803.24	183.22	-65%	199,985	70,295	-129,691	-65%
		Car 2	989	989	0%	271.16	195.74	-30%	268,134	133,538	-134,596	-30%
		Car 3	835	835	0%	89.38	98.33	10%	14,623	82,092	7,469	10%
		Car 4	2,030	2,030	0%	38.49	47.58	24%	78,155	96,691	18,536	24%
		Car 5	610	610	0%	16.36	47.58	182%	9,941	29,011	19,069	182%
	Car 6	0	0	0%	15.37	47.58	210%	2	6	4	210%	
	Gasoline total	5,657	5,657	0%	218.93	183.15	-16%	1,238,546	1,092,662	-145,884	-12%	
	Diesel Oil	pre-Cars	3,281	3,281	0%	424.46	386.79	-9%	1,368,754	1,022,093	-346,661	-9%
		Car 1	3,666	3,666	0%	398.34	276.24	-30%	1,445,960	1,017,634	-428,326	-30%
		Car 2	8,479	8,479	0%	336.40	133.28	-43%	2,852,325	1,639,772	-1,212,553	-43%
		Car 3	23,785	23,785	0%	558.53	150.44	-73%	13,050,281	3,546,082	-9,504,199	-73%
		Car 4	59,485	59,485	0%	494.22	89.85	-82%	29,369,870	5,337,395	-24,032,475	-82%
		Car 5	15,964	15,964	0%	442.70	89.85	-80%	7,040,461	1,420,906	-5,619,555	-80%
Car 6	1	1	0%	15.14	89.85	-61%	122	72	-50	-61%		
Diesel oil total	114,350	114,350	0%	485.91	126.17	-74%	55,186,382	13,741,354	-41,445,028	-74%		
FCs Total	129,008	129,008	0%	489.51	123.61	-74%	56,344,903	14,834,656	-41,510,247	-74%		
1.A.3.b.ii. Heavy Duty Vehicles Buses	Gasoline	pre-Cars	1,326	1,326	0%	1091.46	1119.45	4%	1,410,640	1,352,283	-58,357	-4%
		Car 1	1,245	1,245	0%	727.34	731.15	1%	1,017,476	1,017,184	-292	-1%
		Car 2	7,789	7,789	0%	703.46	643.34	-9%	5,085,091	4,597,478	-487,613	-9%
		Car 3	14,483	14,483	0%	629.94	457.61	-27%	9,073,137	6,889,744	-2,183,393	-27%
		Car 4	5,331	5,331	0%	468.10	361.85	-22%	2,642,179	1,677,777	-964,402	-22%
		Car 5	20,752	20,752	0%	347.84	182.99	-47%	7,219,563	3,787,467	-3,432,096	-47%
		Car 6	73	73	0%	64.52	182.99	236%	3,961	13,295	9,334	236%
		Buses Total	50,962	50,962	0%	533.22	384.33	-28%	27,141,913	19,945,298	-7,196,615	-28%
	Diesel Oil	pre-Cars	6,922	6,922	0%	1036.95	758.82	-27%	7,107,543	5,252,345	-1,855,198	-27%
		Car 1	3,630	3,630	0%	743.70	570.57	-24%	2,721,326	2,071,111	-650,215	-24%
		Car 2	23,577	23,577	0%	818.27	516.43	-37%	19,262,253	12,175,855	-7,086,398	-37%
		Car 3	96,735	96,735	0%	634.65	370.21	-42%	61,387,137	35,888,665	-25,498,472	-42%
		Car 4	50,550	50,550	0%	356.50	288.44	-19%	19,962,680	16,880,877	-3,081,723	-19%
		Car 5	485,981	485,981	0%	261.24	152.32	-42%	116,149,855	61,626,577	-54,523,278	-42%
Car 6	2,380	2,380	0%	188.487	360.323	345%	188,487	360,323	171,836	223%		
Trucks Total	589,585	589,585	0%	385.33	224.69	-41%	224,829,180	132,064,153	-92,765,027	-41%		
1.A.3.b.iii. Heavy Duty Vehicles Trucks & Lorries	Gasoline	pre-Cars	6,780	6,780	0%	122.76	151.03	23%	822,530	1,011,520	188,991	23%
		Car 1	4,386	4,386	0%	124.61	171.39	38%	536,615	738,050	201,435	38%
		Car 2	3,287	3,287	0%	136.22	184.55	43%	445,087	636,853	191,766	43%
		Car 3	3,984	3,984	0%	38.66	184.55	382%	18,386	778,616	760,230	382%
		Car 4	0	0	0%	0	0	0%	0	0	0	0%
		Car 5	0	0	0%	0	0	0%	0	0	0	0%
		FCs Total	18,268	18,268	0%	107.43	173.28	61%	1,982,546	3,165,438	1,182,891	61%
		1.A.3.b. Road Transport	2,084,964	2,084,964	0%	295.79	151.71	-49%	616,721,438	396,381,343	-220,340,094	-49%

Adjustment details for 2023

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions					
		current	adjusted	difference	current	adjusted	difference	current	adjusted	difference			
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [kg]	in [kg]	in [%]			
1.A.3.a.i. Passenger Cars	Gasoline	pre-Cars	11,680	11,680	0%	618.27	649.35	-5%	7,011,641	6,967,452	-44,189	-5%	
		Car 1	37,743	37,743	0%	353.78	341.68	-32%	13,362,966	9,129,436	-4,233,530	-32%	
		Car 2	62,680	62,680	0%	188.93	139.33	-27%	11,889,922	8,722,244	-3,167,678	-27%	
		Car 3	97,782	97,782	0%	66.38	73.19	10%	6,481,618	7,156,920	675,302	10%	
		Car 4	397,911	397,911	0%	47.22	46.52	-1%	18,790,345	18,589,937	-200,407	-1%	
		Car 5	138,063	138,063	0%	18.60	46.52	150%	2,583,150	6,439,691	3,856,541	150%	
	Gasoline total	748,116	748,116	0%	88.35	74.85	-16%	68,190,887	56,671,737	-11,519,150	-16%		
	Diesel Oil	pre-Cars	1,389	1,389	0%	312.32	284.56	-9%	433,081	368,136	-64,945	-9%	
		Car 1	5,425	5,425	0%	298.42	246.79	-17%	1,678,472	1,340,688	-337,784	-17%	
		Car 2	28,437	28,437	0%	406.84	279.91	-40%	11,563,522	6,253,531	-5,309,991	-40%	
		Car 3	92,795	92,795	0%	574.33	176.67	-69%	53,284,956	16,579,373	-36,705,583	-69%	
		Car 4	222,583	222,583	0%	393.55	149.27	-62%	87,598,471	33,225,566	-54,372,905	-62%	
Car 5		233,786	233,786	0%	435.42	149.27	-66%	101,787,275	34,884,788	-66,902,487	-66%		
1.A.3.b.i. Heavy Duty Vehicles (LDVs)	Gasoline	Car 6	4,536	4,536	0%	259.53	149.27	-42%	1,177,151	677,045	-500,106	-42%	
		Diesel oil total	589,131	589,131	0%	437.14	158.71	-64%	257,533,128	83,899,619	-173,633,509	-64%	
		FCs Total	1,338,247	1,338,247	0%	237.40	111.77	-53%	317,723,135	146,576,886	-171,146,249	-53%	
		Diesel Oil	pre-Cars	981	981	0%	633.81	645.95	2%	568,320	575,293	6,973	2%
			Car 1	184	184	0%	803.50	183.22	-65%	187,281	59,328	-127,953	-65%
			Car 2	836	836	0%	274.42	291.18	21%	229,520	188,285	-41,235	-21%
	Car 3		784	784	0%	52.66	181.79	10%	72,691	79,780	7,089	10%	
	Car 4		1,089	1,089	0%	43.70	48.89	20%	77,284	82,833	5,549	20%	
	Car 5		965	965	0%	16.67	48.89	183%	16,187	47,268	31,081	183%	
	Gasoline total	5,578	5,578	0%	262.86	184.67	-3%	1,137,299	1,096,727	-40,572	-3%		
	Diesel Oil	pre-Cars	2,744	2,744	0%	424.37	386.79	-9%	1,168,757	944,928	-223,829	-9%	
		Car 1	2,945	2,945	0%	398.34	276.24	-30%	1,166,762	834,566	-332,196	-30%	
Car 2		6,982	6,982	0%	336.92	133.28	-43%	2,340,147	1,350,674	-989,473	-43%		
Car 3		20,421	20,421	0%	568.12	150.38	-73%	11,437,995	3,070,913	-8,367,082	-73%		
Car 4		55,087	55,087	0%	497.72	90.45	-82%	27,776,440	5,048,416	-22,728,024	-82%		
Car 5		29,024	29,024	0%	14,971	90.45	-80%	13,911,325	2,687,964	-10,823,361	-80%		
Diesel oil total	118,777	118,777	0%	488.66	154.93	-76%	47,083,533	13,656,488	-33,427,045	-76%			
LDVs Total	124,354	124,354	0%	484.14	184.63	-76%	18,214,142	16,617,275	-1,596,867	-76%			
1.A.3.b.ii. Heavy Duty Vehicles (MDVs)	Gasoline	pre-Cars	1,172	1,172	0%	1096.89	1118.23	-4%	1,249,028	1,194,143	-54,885	-4%	
		Car 1	1,004	1,004	0%	727.95	170.88	-76%	766,620	791,181	24,561	76%	
		Car 2	6,084	6,084	0%	764.37	643.48	-16%	5,324,969	4,576,271	-748,698	-16%	
		Car 3	13,167	13,167	0%	628.43	457.65	-27%	8,262,880	5,980,226	-2,284,655	-27%	
		Car 4	4,945	4,945	0%	485.55	351.71	-27%	2,270,611	1,739,796	-530,815	-27%	
		Car 5	26,096	26,096	0%	388.98	183.48	-40%	8,435,683	4,420,733	-4,014,950	-40%	
	Gasoline total	537	537	0%	44.76	183.48	310%	34,047	86,972	52,925	310%		
	Diesel Oil	pre-Cars	91,796	91,796	0%	509.54	380.06	-26%	28,760,969	18,620,483	-7,738,126	-26%	
		Car 1	5,983	5,983	0%	1036.72	717.35	-29%	6,072,150	4,322,888	-1,749,262	-29%	
		Car 2	29,845	29,845	0%	743.27	585.27	-21%	1,150,940	1,066,909	-82,031	-21%	
		Car 3	16,966	16,966	0%	918.17	610.47	-34%	1,208,081	940,959	-267,122	-34%	
		Car 4	78,750	78,750	0%	823.53	587.43	-29%	47,837,440	27,587,440	-20,250,000	-29%	
Car 5		42,781	42,781	0%	356.90	287.27	-27%	16,936,987	12,989,770	-3,947,217	-27%		
1.A.3.b.iii. Heavy Duty Vehicles (LDDVs)	Gasoline	Car 6	436,960	436,960	0%	261.70	152.65	-66%	193,161,324	86,796,496	-106,364,827	-66%	
		Gasoline total	180,020	180,020	0%	58.67	152.65	261%	913,082	2,750,630	1,837,548	261%	
		Trucks Total	3,697,739	3,697,739	0%	253.36	287.20	-47%	211,087,531	124,188,949	-86,898,582	-47%	
		Diesel Oil	pre-Cars	6,362	6,362	0%	123.07	119.79	-2%	181,736	164,179	-17,557	-2%
			Car 1	4,013	4,013	0%	102.03	173.15	70%	562,073	694,880	132,807	70%
			Car 2	3,362	3,362	0%	132.24	195.58	49%	435,668	645,804	209,136	49%
	Car 3		4,562	4,562	0%	39.81	185.58	381%	181,610	882,175	700,565	381%	
	Car 4		0	0	0%	0	0	0%	0	0	0	0%	
	Car 5		0	0	0%	0	0	0%	0	0	0	0%	
	MDVs Total	18,029	18,029	0%	104.34	175.38	68%	5,962,088	5,187,618	-1,294,951	-68%		
	1.A.3.b. Road Transport		2,132,683	2,132,683	0%	208.88	145.76	-56%	616,079,063	390,854,371	-395,224,692	-56%	

NER Code	Fuel	Activity Data			Implied Emission Factor			MO ₂ Emissions				
		current in [t]	adjusted in [t]	difference in [%]	current in [kg/t]	adjusted in [kg/t]	difference in [%]	current in [kg]	adjusted in [kg]	difference in [%]		
1.A.3.b.1. Passenger Car	Gasoline	pre-Euro	116,607	116,607	0%	812.37	844.11	-11%	7,132,580	6,337,484	-796,044	-11%
		Euro 1	30,667	30,667	0%	364.77	263.93	-30%	11,062,246	7,480,541	-3,521,705	-30%
		Euro 2	53,486	53,486	0%	196.58	140.31	-29%	10,514,477	7,584,432	-3,816,844	-32%
		Euro 3	87,374	87,374	0%	68.31	75.83	7%	6,965,588	6,459,377	-424,216	7%
		Euro 4	387,139	387,139	0%	45.16	47.80	-3%	13,093,585	10,536,009	-2,557,535	-3%
		Euro 5	171,250	171,250	0%	18.50	47.80	157%	3,183,252	8,187,581	-5,004,289	157%
	Gasoline total	10,321,615	10,321,615	0%	257.87	257.87	0%	50,757,868	43,317,254	-7,440,614	-15%	
	Gasoline total	752,596	752,596	0%	70.30	73.69	-4%	52,725,533	56,986,591	-2,261,612	-4%	
	Diesel Oil	pre-Euro	1,341	1,341	0%	311.73	264.96	-16%	217,967	356,266	-42,752	-16%
		Euro 1	4,962	4,962	0%	298.92	267.29	-11%	1,482,284	1,387,663	-165,115	-11%
Euro 2		23,934	23,934	0%	406.71	220.45	-46%	9,734,484	5,276,400	-4,458,894	-46%	
Euro 3		82,749	82,749	0%	585.53	176.81	-69%	48,481,830	14,796,245	-33,685,585	-69%	
Euro 4		211,237	211,237	0%	307.27	151.77	-42%	63,917,068	32,059,973	-31,857,706	-42%	
Euro 5		285,011	285,011	0%	436.38	151.77	-65%	124,721,396	43,730,380	-81,434,896	-65%	
Gasoline total	65,081	65,081	0%	253.34	151.77	-39%	4,175,580	2,640,686	-1,729,814	-39%		
Diesel Oil total	626,456	626,456	0%	229.81	180.12	-21%	222,435,061	96,643,913	-125,791,148	-56%		
Diesel Oil total	1,338,571	1,338,571	0%	218.44	151.77	-30%	138,897,546	154,543,813	-175,478,267	-53%		
1.A.3.b.2. Light Duty Vehicles (LDV)	Gasoline	pre-Euro	996	996	0%	634.74	646.95	2%	589,663	575,724	-18,844	2%
		Euro 1	173	173	0%	886.21	389.99	-54%	160,074	53,875	-96,499	-54%
		Euro 2	748	748	0%	264.73	287.11	21%	212,880	154,839	-58,029	-27%
		Euro 3	177	177	0%	56.62	185.21	7%	75,952	81,070	5,878	7%
		Euro 4	1,067	1,067	0%	43.47	50.15	15%	81,129	83,610	12,475	15%
		Euro 5	1,374	1,374	0%	17.51	50.15	183%	23,517	30,636	6,461	183%
	Gasoline total	5,815	5,815	0%	18.06	50.15	179%	312	807	495	179%	
	Diesel Oil	pre-Euro	2,617	2,617	0%	496.34	176.49	-73%	5,114,544	1,031,652	-4,082,892	-73%
		Euro 1	2,589	2,589	0%	426.76	176.49	-71%	1,064,675	287,719	-776,956	-71%
		Euro 2	6,087	6,087	0%	393.62	270.25	-30%	987,136	559,649	-427,428	-30%
Euro 3		6,087	6,087	0%	338.61	183.25	-42%	1,585,985	1,180,889	-425,126	-42%	
Euro 4		18,220	18,220	0%	511.75	150.58	-74%	4,171,076	2,142,456	-2,028,620	-74%	
Euro 5		52,361	52,361	0%	499.70	91.89	-82%	26,164,486	8,749,746	-17,394,740	-82%	
Gasoline total	45,749	45,749	0%	436.44	91.89	-79%	29,486,234	4,250,626	-25,237,709	-79%		
Diesel Oil total	18,787	18,787	0%	511.18	91.89	-82%	29,829	17,974	-11,855	-40%		
Diesel Oil total	148,558	148,558	0%	475.56	150.96	-77%	65,146,555	16,287,231	-48,859,318	-77%		
LDVs total	134,443	134,443	0%	463.1								

MFR Code	Fuel	Activity Data				Applied Emission Factor				NO _x Emissions			
		current	adjusted	difference	in %	current	adjusted	difference	in %	current	adjusted	adjustment	difference in %
		in [t]	in [t]	in [t]		in [kg/t]	in [kg/t]	in [t]		in [t]	in [t]	in [t]	in %
1.A.3.a.i. Passenger Cars	Gasoline	pre-Euro	11,380	11,380	0%	833.23	844.11	-10.88	-1.3%	7,206.112	6,191.962	-1,014.150	-14%
		Euro 1	34,112	34,112	0%	371.34	245.71	-125.63	-34%	8,963.881	6,924.572	-2,039.309	-23%
		Euro 2	42,925	42,925	0%	207.78	142.09	-65.69	-32%	8,919.795	6,099.059	-2,819.736	-32%
		Euro 3	72,871	72,871	0%	73.86	74.74	0.88	1%	5,381.351	5,440.237	58.887	1%
		Euro 4	353,474	353,474	0%	52.36	49.02	-3.34	-6%	18,485.037	17,326.221	-1,158.816	-6%
		Euro 5	180,783	180,783	0%	19.11	45.02	-25.91	-135%	3,454.481	8,081.456	4,626.975	135%
	Diesel Oil	Euro 1	23,012	23,012	0%	35.76	420.781	385.02	84%	750.773	1,413.133	662.360	88%
		Euro 2	715,156	715,156	0%	74.38	217.83	-143.45	-19%	53,130.187	19,380.964	-33,749.223	-64%
		pre-Euro	1,282	1,282	0%	318.32	264.96	-53.36	-16%	387.917	320.733	-67.184	-16%
		Euro 1	4,219	4,219	0%	298.14	244.74	-53.40	-18%	1,261.930	1,129.989	-131.941	-10%
1.A.3.a.ii. Light Duty Vehicles (LDV)	Gasoline	Euro 2	19,689	19,689	0%	407.90	220.36	-187.54	-46%	8,013.587	4,339.719	-3,673.868	-46%
		Euro 3	71,044	71,044	0%	595.91	179.04	-416.87	-70%	42,271.649	12,719.962	-29,551.687	-70%
		Euro 4	182,410	182,410	0%	401.42	154.07	-247.35	-62%	77,227.055	29,644.450	-47,582.605	-62%
		Euro 5	364,346	364,346	0%	434.62	154.07	-280.55	-65%	132,290.493	46,890.424	-85,400.069	-65%
		Euro 6	52,676	52,676	0%	253.76	154.07	-99.69	-40%	11,657.082	8,100.384	-3,556.778	-31%
		Diesel oil total	645,535	645,535	0%	406.19	150.88	-255.31	-63%	275,136.233	183,161.591	-91,964.732	-33%
	LDV Total	5,360,124	5,360,124	0%	415.22	151.52	-263.70	-63%	328,347.000	154,444.468	-173,892.532	-47%	
	Diesel Oil	pre-Euro	979	979	0%	954.31	685.39	-268.92	-28%	575.300	547.977	-27.323	-5%
		Euro 1	1,850	1,850	0%	895.63	311.93	-583.70	-65%	134.523	48.851	-85.672	-65%
		Euro 2	629	629	0%	298.27	212.94	-85.33	-29%	187.533	133.879	-53.654	-29%
Euro 3		781	781	0%	90.50	188.62	98.12	11%	73.989	76.155	2.166	3%	
1.A.3.a.iii. Heavy Duty Vehicle Buses	Gasoline	Euro 4	1,720	1,720	0%	47.96	51.30	3.34	7%	89.950	80.240	-9.710	-9%
		Euro 5	1,620	1,620	0%	18.61	51.30	32.69	175%	29.812	83.086	53.274	179%
		Euro 6	84	84	0%	18.71	51.30	32.59	174%	1.752	4.884	3.102	174%
		Gasoline total	5,193	5,193	0%	597.52	172.88	-424.64	-71%	1,083.507	1,086.998	3.491	0%
		pre-Euro	2,323	2,323	0%	474.91	386.79	-88.12	-19%	598.185	772.571	253.454	42%
		Euro 1	2,196	2,196	0%	391.47	495.45	103.98	27%	824.237	453.227	-371.010	-45%
	Diesel Oil	Euro 2	5,025	5,025	0%	334.81	183.29	-151.52	-45%	1,622.296	971.296	-651.000	-40%
		Euro 3	15,781	15,781	0%	580.35	150.67	-429.68	-74%	9,112.414	2,385.713	-6,726.701	-74%
		Euro 4	47,480	47,480	0%	501.73	91.74	-409.99	-82%	23,782.396	4,340.290	-19,442	

Adjustment details for 2026

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	difference		
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [t]	in [t]	in [%]		
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	15,782	15,782	0%	634.75	644.11	-14%	7,470,914	6,410,967	-1,059,947	
		Car 1	20,270	20,270	0%	372.25	201.68	-35%	7,545,483	4,988,888	-2,556,595	
		Car 2	36,062	36,062	0%	212.73	143.11	-33%	7,671,581	5,180,897	-2,490,684	
		Car 3	83,039	83,039	0%	76.17	75.50	-1%	4,881,482	4,759,259	-122,223	
		Car 4	334,413	334,413	0%	53.74	50.17	-7%	17,969,364	16,777,445	-1,191,919	
		Car 5	183,374	183,374	0%	19.09	50.17	163%	3,580,745	9,189,834	5,609,089	
		Car 6	66,332	66,332	0%	26.67	50.17	88%	1,768,917	3,327,850	1,558,933	
	Gasoline total	715,272	715,272	0%	78.93	70.65	-9%	58,736,967	50,535,049	-8,201,918		
	Diesel Oil	pre-Cars	1,280	1,280	0%	304.76	264.56	-14%	386,262	339,172	-47,090	
		Car 1	3,749	3,749	0%	1,122.49	1,011.62	-10%	1,122,449	1,011,626	-111,425	
		Car 2	16,584	16,584	0%	407.19	221.43	-46%	6,720,132	3,653,964	-3,066,168	
		Car 3	81,398	81,398	0%	802.50	179.24	-78%	36,991,999	11,085,409	-25,906,590	
		Car 4	175,940	175,940	0%	405.76	156.24	-61%	71,362,220	27,474,086	-43,888,134	
		Car 5	299,654	299,654	0%	433.34	156.24	-64%	130,032,044	46,019,229	-83,912,815	
		Car 6	116,084	116,084	0%	268.75	156.24	-42%	30,427,555	10,232,785	-20,194,770	
	Diesel oil total	625,119	625,119	0%	418.36	160.76	-61%	277,947,660	188,535,230	-89,412,430		
	Flx Total	1,380,391	1,380,391	0%	235.75	154.41	-51%	327,736,627	199,070,280	-128,666,347		
1.A.3.b.i - Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	910	910	0%	602.79	645.95	-7%	593,186	587,543	-5,643	
		Car 1	136	136	0%	908.31	312.78	-66%	122,126	42,425	-79,701	
		Car 2	540	540	0%	308.39	217.84	-29%	162,311	117,737	-44,574	
		Car 3	650	650	0%	108.43	111.57	-3%	70,432	72,731	2,299	
		Car 4	1,684	1,684	0%	43.06	52.36	7%	78,714	84,003	5,289	
		Car 5	1,724	1,724	0%	19.82	52.36	164%	34,157	80,258	46,101	
		Car 6	363	363	0%	19.85	52.36	181%	6,764	19,992	13,228	
	Gasoline total	5,506	5,506	0%	588.27	171.66	-71%	1,068,292	844,478	-223,814		
	Diesel Oil	pre-Cars	2,189	2,189	0%	414.81	386.79	-7%	899,849	886,433	-13,416	
		Car 1	1,780	1,780	0%	391.89	276.25	-30%	780,189	585,371	-194,798	
Car 2		4,223	4,223	0%	323.43	153.31	-53%	1,365,994	676,452	-689,542		
1.A.3.b.ii - Heavy Duty Vehicles (HDVs)	Diesel Oil	Car 3	13,582	13,582	0%	588.91	150.77	-74%	8,064,323	2,940,233	-5,124,090	
		Car 4	43,141	43,141	0%	504.48	32.40	-93%	21,783,989	3,986,141	-17,797,848	
		Car 5	74,231	74,231	0%	434.16	32.40	-93%	32,223,283	6,688,780	-25,534,503	
		Car 6	4,921	4,921	0%	113.49	32.40	-72%	755,285	454,676	-300,609	
		Diesel oil total	148,068	148,068	0%	454.12	185.62	-59%	65,712,732	15,256,007	-50,456,725	
		LDVs Total	148,994	148,994	0%	445.21	188.29	-58%	66,781,025	16,272,484	-50,508,541	
		1.A.3.b.iii - Heavy Duty Vehicle: Trucks & Lorries	Diesel Oil	pre-Cars	891	891	0%	1076.81	1919.23	-43%	964,197	988,234
Car 1	583			583	0%	731.36	732.67	0%	433,675	446,236	12,561	
Car 2	4,375			4,375	0%	708.25	645.03	-9%	3,440,614	2,822,621	-617,993	
Car 3	10,333			10,333	0%	632.87	458.91	-28%	6,539,364	4,741,827	-1,797,537	
Car 4	4,449			4,449	0%	475.90	382.29	-20%	2,117,219	1,686,881	-430,338	
Car 5	34,380			34,380	0%	364.36	185.22	-49%	8,935,974	4,517,517	-4,418,457	
Car 6	9,126			9,126	0%	62.79	185.22	196%	573,066	1,680,431	1,107,365	
Trucks Total	54,157		54,157	0%	404.73	388.24	-4%	23,082,189	16,885,117	-6,197,072		
1.A.3.b.iv - Motorized Two-Wheelers (MOWs)	Gasoline		pre-Cars	3,933	3,933	0%	1,034.81	737.35	-29%	4,087,249	2,980,379	-1,106,870
			Car 1	1,555	1,555	0%	748.16	587.92	-21%	1,163,482	789,813	-373,669
		Car 2	8,876	8,876	0%	817.75	585.42	-28%	7,258,047	4,486,626	-2,771,421	
		Car 3	34,167	34,167	0%	638.91	568.04	-11%	21,553,280	12,251,155	-9,302,125	
		Car 4	34,287	34,287	0%	394.94	281.86	-28%	9,640,364	6,885,621	-2,754,743	
		Car 5	269,735	269,735	0%	267.22	153.60	-42%	74,680,233	39,976,610	-34,703,623	
		Car 6	261,480	261,480	0%	61.77	153.60	149%	16,149,280	40,244,036	24,094,756	
MOWs Total	594,013	594,013	0%	226.31	180.97	-26%	134,431,899	101,486,262	-32,945,637			
1.A.3.b - Road Transport	Gasoline	pre-Cars	5,543	5,543	0%	125.59	155.78	24%	696,072	883,289	187,217	
		Car 1	3,360	3,360	0%	127.11	177.29	39%	427,113	585,796	158,683	
		Car 2	3,375	3,375	0%	125.94	187.68	50%	421,961	687,078	265,117	
		Car 3	6,443	6,443	0%	48.36	187.68	281%	209,627	1,273,671	1,064,044	
		Car 4	65	65	0%	17.47	187.68	1031%	1,134	12,632	11,498	
MOWs Total	18,185	18,185	0%	95.14	181.68	89%	1,885,897	3,452,476	1,566,579			
1.A.3.b - Road Transport		Total	2,267,339	2,267,339	0%	258.89	137.22	-46%	553,799,598	362,981,620	-190,817,978	

Adjustment details for 2027

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	difference		
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [t]	in [t]	in [%]		
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	12,282	12,282	0%	636.73	644.11	-11%	7,814,267	6,680,187	-1,134,080	
		Car 1	17,449	17,449	0%	372.96	241.68	-35%	6,588,311	4,217,644	-2,370,667	
		Car 2	30,435	30,435	0%	217.43	141.75	-35%	6,617,570	4,314,140	-2,303,430	
		Car 3	54,271	54,271	0%	78.48	76.27	-3%	4,254,938	4,139,376	-115,562	
		Car 4	315,086	315,086	0%	54.96	51.26	-7%	17,316,320	16,151,881	-1,164,439	
		Car 5	180,240	180,240	0%	19.17	51.26	163%	3,485,382	9,239,815	5,754,433	
		Car 6	114,791	114,791	0%	26.66	51.26	82%	3,063,235	5,884,372	2,821,137	
		Gasoline total	724,571	724,571	0%	67.66	60.88	-10%	49,046,874	40,534,474	-8,512,400	
	Diesel Oil	pre-Cars	1,780	1,780	0%	364.36	254.56	-30%	480,963	347,626	-133,337	
		Car 1	3,360	3,360	0%	294.17	271.67	-8%	1,082,288	910,182	-172,106	
		Car 2	13,788	13,788	0%	407.17	222.43	-45%	5,914,130	3,066,393	-2,847,737	
		Car 3	52,128	52,128	0%	808.95	179.65	-78%	31,696,478	9,364,788	-22,331,690	
		Car 4	187,947	187,947	0%	418.16	158.34	-61%	64,733,485	24,983,323	-39,750,162	
1.A.3.b.i - Heavy Duty Vehicles (HDVs)	Gasoline	Car 5	283,480	283,480	0%	423.99	158.34	-63%	120,187,695	44,873,190	-75,314,505	
		Car 6	184,768	184,768	0%	262.61	158.34	-40%	48,521,163	29,255,985	-19,265,178	
		Diesel oil total	686,562	686,562	0%	394.65	161.95	-59%	272,126,081	112,890,717	-159,235,364	
		Flx Total	1,421,142	1,421,142	0%	225.98	155.61	-30%	521,152,955	163,425,191	-357,727,764	
		Diesel Oil	pre-Cars	940	940	0%	611.41	645.95	-7%	612,247	566,878	-45,369
			Car 1	124	124	0%	908.23	312.78	-66%	112,083	39,682	-72,401
			Car 2	485	485	0%	302.12	221.62	-27%	140,344	102,950	-37,394
			Car 3	596	596	0%	118.57	115.36	-3%	65,955	68,812	2,857
	Car 4		1,476	1,476	0%	50.72	53.38	5%	74,877	78,816	3,939	
	Car 5		1,680	1,680	0%	21.73	53.38	146%	35,240	89,034	53,794	
	Car 6		910	910	0%	19.18	53.38	187%	17,052	49,080	32,028	
	Gasoline total		6,186	6,186	0%	171.55	167.18	-2%	1,058,799	1,034,211	-24,588	
	Diesel Oil	pre-Cars	2,067	2,067	0%	413.41	386.79	-7%	860,499	811,163	-49,336	
Car 1		1,538	1,538	0%	398.47	276.25	-30%	680,795	511,158	-169,637		
Car 2		3,580	3,580	0%	321.26	153.04	-53%	1,143,793	687,293	-456,500		
Car 3		11,684	11,684	0%	595.30	150.79	-75%	6,940,879	1,758,747	-5,182,132		
Car 4		39,050	39,050	0%	506.70	33.69	-93%	19,789,647	3,635,035	-16,154,612		
Car 5		75,789	75,789	0%	432.66	33.69	-92%	32,790,965	7,054,945	-25,736,020		
Car 6		19,625	19,625	0%	151.71	33.69	-78%	2,977,439	1,026,876	-1,950,563		
Diesel oil total		153,284	153,284	0%	404.66	183.89	-55%	65,083,930	15,925,296	-49,168,634		
1.A.3.b.ii - Heavy Duty Vehicles (HDVs)	Diesel Oil	LDVs total	199,470	199,470	0%	414.83	186.35	-74%	66,152,129	16,969,427	-49,182,702	
		pre-Cars	736	736	0%	707.33	191.23	-73%	790,259	750,425	-39,834	
		Car 1	411	411	0%	721.97	352.57	-51%	380,684	389,062	8,438	
		Car 2	3,325	3,325	0%	797.91	362.49	-54%	2,820,887	1,247,480	-1,573,407	
		Car 3	8,578	8,578	0%	621.37	459.12	-26%	4,478,440	2,948,716	-1,529,724	
		Car 4	3,823	3,823	0%	474.97	345.79	-27%	1,952,380	1,347,630	-604,750	
		Car 5	21,913	21,913	0%	363.90	185.64	-49%	7,937,974	4,063,646	-3,874,329	
		Car 6	16,686	16,686	0%	68.52	185.84	270%	86,215	272,590	186,375	
	Beesen Total	53,382	53,382	0%	318.80	280.71	-23%	19,793,981	15,384,828	-4,409,153		
	Trucks & Lorries	pre-Cars	3,680	3,680	0%	1034.40	717.35	-29%	3,730,272	2,659,676	-1,070,596	
		Car 1	1,311	1,311	0%	748.03	468.38	-37%	980,942	614,151	-366,790	
		Car 2	7,087	7,087	0%	817.66	583.45	-30%	5,746,836	3,580,026	-2,166,810	
		Car 3	26,886	26,886	0%	838.17	350.72	-44%	15,942,611	9,583,881	-6,358,729	
Car 4		90,082	90,082	0%	797.77	276.24	-30%	7,666,416	4,679,166	-2,987,250		
Car 5		326,345	326,345	0%	364.96	154.76	-41%	19,280,799	11,536,367	-7,744,432		
Car 6		398,065	398,065	0%	66.82	154.35	131%	21,985,366	41,798,611	19,813,245		
Trucks Total		598,263	598,263	0%	595.82	179.92	-96%	116,611,141	105,268,508	-11,342,633		
1.A.3.b.iii - Motorized Two-Wheelers (MWs)	Gasoline	pre-Cars	5,330	5,330	0%	125.91	157.19	25%	671,885	830,789	168,903	
		Car 1	3,257	3,257	0%	128.39	177.86	41%	411,617	579,244	167,627	
		Car 2	3,396	3,396	0%	122.55	180.33	48%	415,280	673,548	258,268	
		Car 3	6,741	6,741	0%	40.22	180.33	363%	271,187	1,336,956	1,065,769	
		Car 4	430	430	0%	19.29	180.33	983%	7,862	85,270	77,408	
		Car 5	0	0	0%	0.00		0%	0	0	0	
		Car 6	19,180	19,180	0%	92.83	183.39	96%	5,788,674	5,653,187	-134,487	
		MW's total	2,291,437	2,291,437	0%	123.43	135.23	40%	525,549,490	384,489,596	-141,059,894	
	Motorized Two-Wheelers (MWs)	pre-Cars	5,330	5,330	0%	125.91	157.19	25%	671,885	830,789	168,903	
		Car 1	3,257	3,257	0%	128.39	177.86	41%	411,617	579,244	167,627	
		Car 2	3,396	3,396	0%	122.55	180.33	48%	415,280	673,548	258,268	
		Car 3	6,741	6,741	0%	40.22	180.33	363%	271,187	1,336,956	1,065,769	
		Car 4	430	430	0%	19.29	180.33	983%	7,862	85,270	77,408	

Adjustment details for 2018

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	difference		
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [t]	in [t]	in [%]		
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	12,219	12,219	0%	637.58	644.11	-6%	7,780,965	6,648,721	-1,132,234	-15%
		Car 1	14,362	14,362	0%	374.34	341.68	-9%	5,371,161	3,448,643	-1,922,518	-36%
		Car 2	34,285	34,285	0%	221.97	111.68	-50%	5,360,977	2,688,163	-2,672,814	-50%
		Car 3	43,642	43,642	0%	88.16	76.96	-13%	3,487,781	3,358,617	-139,164	-4%
		Car 4	278,738	278,738	0%	55.98	52.30	-7%	15,683,488	14,576,755	-1,106,733	-7%
		Car 5	186,030	186,030	0%	19.35	52.30	-100%	3,228,282	8,725,668	5,497,386	170%
	Diesel Oil	pre-Cars	159,041	159,041	0%	6.00	52.30	-88%	4,190,432	8,718,250	4,527,818	108%
		Car 1	1,363	1,363	0%	64.42	62.36	-3%	45,032,966	47,786,817	2,753,851	6%
		Car 2	2,849	2,849	0%	303.16	254.96	-16%	171,851	345,173	173,322	101%
		Car 3	10,784	10,784	0%	407.20	222.67	-45%	4,391,793	2,483,516	-1,908,278	-43%
		Car 4	40,786	40,786	0%	812.49	180.15	-78%	24,932,029	7,333,241	-17,598,788	-71%
		Car 5	130,534	130,534	0%	414.71	180.40	-56%	54,133,837	20,937,329	-33,196,508	-61%
	LN ₂ Total	pre-Cars	251,212	251,212	0%	416.25	180.40	-56%	104,585,786	40,293,731	-64,292,055	-61%
		Car 5	228,685	228,685	0%	254.87	180.40	-31%	58,284,140	35,680,446	-22,603,694	-39%
1.A.3.b.i - Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	666,074	666,074	0%	375.66	163.38	-56%	247,596,063	188,748,684	-158,767,459	-56%
		Car 1	1,363,181	1,363,181	0%	214.34	154.68	-28%	262,589,060	156,555,421	-106,033,639	-40%
		Car 2	188	188	0%	911.58	312.78	-66%	99,859	182,652	82,793	83%
		Car 3	377	377	0%	303.84	224.45	-26%	114,682	84,713	-29,969	-26%
		Car 4	511	511	0%	111.92	116.84	5%	57,282	60,739	3,457	6%
		Car 5	1,275	1,275	0%	52.02	54.36	4%	65,290	69,270	3,980	4%
	Diesel Oil	pre-Cars	1,483	1,483	0%	23.70	54.36	129%	35,160	80,626	45,466	129%
		Car 1	1,643	1,643	0%	19.18	54.36	182%	39,550	89,326	49,776	182%
		Car 2	6,315	6,315	0%	154.22	160.11	4%	999,199	1,011,136	11,937	1%
		Car 3	1,872	1,872	0%	411.51	386.79	-6%	771,337	574,742	-196,595	-26%
		Car 4	1,285	1,285	0%	389.94	276.25	-29%	483,129	272,296	-210,833	-44%
		Car 5	2,942	2,942	0%	318.56	153.88	-51%	965,389	550,789	-414,600	-43%
	LN ₂ Total	pre-Cars	9,363	9,363	0%	558.10	150.74	-73%	5,689,152	1,411,299	-4,277,853	-75%
		Car 5	33,232	33,232	0%	508.42	93.81	-82%	15,929,185	3,117,457	-12,811,728	-80%
1.A.3.b.ii - Heavy Duty Vehicle Buses	Gasoline	pre-Cars	66,283	66,283	0%	432.92	93.81	-78%	28,684,080	6,217,860	-22,466,220	-78%
		Car 1	39,482	39,482	0%	158.79	93.81	-41%	5,941,615	3,686,228	-2,255,387	-38%
		Car 2	154,259	154,259	0%	384.71	182.69	-53%	98,344,525	55,880,316	-42,464,209	-44%
		Car 3	180,574	180,574	0%	375.86	184.94	-51%	69,343,125	36,851,449	-32,491,676	-47%
		Car 4	547	547	0%	1078.16	1919.23	78%	589,267	557,147	-32,120	-5%
		Car 5	237	237	0%	732.77	178.38	-76%	173,678	178,386	4,708	3%
	Diesel Oil	pre-Cars	2,270	2,270	0%	787.83	646.33	-18%	1,780,686	1,447,437	-333,249	-19%
		Car 1	6,757	6,757	0%	638.89	459.32	-29%	4,262,734	3,183,432	-1,079,302	-25%
		Car 2	3,043	3,043	0%	473.16	382.73	-19%	1,439,790	1,073,333	-366,457	-26%
		Car 3	18,189	18,189	0%	362.42	186.37	-49%	6,463,265	3,376,016	-3,087,249	-48%
		Car 4	20,670	20,670	0%	64.89	186.37	289%	1,176,026	3,682,314	2,506,288	213%
		Car 5	91,634	91,634	0%	309.75	283.53	-8%	15,993,526	13,687,186	-2,306,340	-15%
	LN ₂ Total	pre-Cars	3,282	3,282	0%	1034.82	737.35	-29%	3,375,359	2,485,071	-890,288	-26%
		Car 5	1,094	1,094	0%	747.82	488.39	-34%	918,052	512,378	-405,674	-44%
1.A.3.b.iii - Heavy Duty Vehicle Trucks & Lorries	Gasoline	pre-Cars	5,544	5,544	0%	817.44	581.68	-29%	4,532,190	2,781,516	-1,750,674	-39%
		Car 1	20,583	20,583	0%	629.54	563.68	-10%	12,367,751	7,277,279	-5,090,472	-41%
		Car 2	15,912	15,912	0%	358.89	276.23	-23%	6,334,421	4,386,424	-1,947,997	-31%
		Car 3	154,983	154,983	0%	250.40	154.68	-38%	45,964,153	24,283,389	-21,680,764	-47%
		Car 4	381,799	381,799	0%	68.78	154.68	125%	28,251,482	69,665,886	41,414,404	147%
		Car 5	585,186	585,186	0%	515.18	172.19	-66%	188,173,537	180,760,889	-7,412,648	-4%
	Diesel Oil	pre-Cars	4,940	4,940	0%	128.95	186.61	45%	622,656	783,451	160,795	26%
		Car 1	2,966	2,966	0%	128.14	177.73	41%	374,114	527,294	153,180	41%
		Car 2	3,221	3,221	0%	128.33	186.64	45%	387,596	639,633	252,037	65%
		Car 3	6,241	6,241	0%	48.24	186.64	284%	20,126	1,239,686	988,562	394%
		Car 4	1,130	1,130	0%	58.41	186.64	220%	23,066	224,582	201,516	875%
		Car 5	0	0	0%	0.00	186.61	0%	0	0	0	0%
	LN ₂ Total	pre-Cars	18,487	18,487	0%	85.66	186.61	118%	1,658,558	3,434,767	1,776,209	108%
		Car 5	2,189,983	2,189,983	0%	215.85	133.49	-38%	478,758,286	291,129,652	-187,628,634	-39%

Adjustment details for 2019

Detailed Data for 2022												
NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	difference		
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [t]	in [t]	in [%]		
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	13,648	13,648	0%	638.58	644.11	-6%	8,664,621	7,382,686	-1,281,935	-15%
		Car 1	12,427	12,427	0%	378.32	341.68	-9%	4,781,480	3,683,383	-1,098,096	-23%
		Car 2	20,086	20,086	0%	225.58	92.59	-59%	4,531,070	1,858,018	-2,672,852	-59%
		Car 3	38,216	38,216	0%	82.22	76.12	-7%	2,977,840	2,829,186	-148,654	-5%
		Car 4	295,220	295,220	0%	57.04	53.29	-7%	14,588,285	13,589,621	-998,664	-7%
		Car 5	180,537	180,537	0%	19.77	53.29	-100%	3,173,728	8,584,356	5,410,628	170%
	Diesel Oil	pre-Cars	285,636	285,636	0%	25.63	53.29	180%	5,295,099	11,010,782	5,715,683	108%
		Car 1	1,363,181	1,363,181	0%	62.36	68.45	10%	43,961,941	48,238,025	4,276,084	10%
		Car 2	1,745	1,745	0%	313.70	254.96	-19%	193,180	234,621	41,441	21%
		Car 3	2,545	2,545	0%	298.80	272.65	-9%	784,913	687,786	-97,127	-12%
		Car 4	8,891	8,891	0%	407.19	229.16	-44%	3,620,286	2,037,480	-1,582,806	-44%
		Car 5	33,079	33,079	0%	615.11	180.42	-71%	20,310,125	5,967,483	-14,342,642	-71%
	LN ₂ Total	pre-Cars	111,335	111,335	0%	419.17	182.44	-56%	48,688,685	10,885,228	-37,803,457	-78%
		Car 5	231,784	231,784	0%	419.37	182.44	-56%	95,117,643	37,650,997	-57,466,646	-60%
1.A.3.b.i - Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	273,511	273,511	0%	227.36	182.44	-20%	62,183,230	44,429,184	-17,754,046	-29%
		Car 1	663,841	663,841	0%	345.81	165.67	-52%	229,566,088	189,582,982	-139,983,106	-61%
		Car 2	1,368,532	1,368,532	0%	199.83	155.32	-22%	273,668,009	157,821,687	-115,846,322	-42%
		Car 3	909	909	0%	644.89	646.36	1%	687,449	581,962	-105,487	-15%
		Car 4	87	87	0%	915.20	312.78	-66%	89,953	30,396	-59,557	-66%
		Car 5	316	316	0%	304.63	224.45	-26%	96,158	70,848	-25,310	-26%
	Diesel Oil	pre-Cars	447	447	0%	112.68	121.47	8%	59,355	54,283	-5,072	-9%
		Car 1	1,126	1,126	0%	53.08	55.26	4%	59,652	62,199	2,547	4%
		Car 2	1,361	1,361	0%	25.34	55.26	119%	34,240	74,680	40,440	119%
		Car 3	2,420	2,420	0%	18.75	55.26	188%	45,383	133,753	88,370	193%
		Car 4	6,483	6,483	0%	146.88	153.25	9%	974,279	1,044,150	69,871	7%
		Car 5	1,744	1,744	0%	418.96	386.79	-7%	725,111	541,376	-183,735	-25%
	LN ₂ Total	pre-Cars	1,079	1,079	0%	389.52	276.25	-29%	420,285	232,256	-188,029	-45%
		Car 5	2,334	2,334	0%	315.90	194.79	-39%	737,682	454,630	-283,052	-39%
1.A.3.b.ii - Heavy Duty Vehicle Tractor & Lorries	Gasoline	pre-Cars	7,649	7,649	0%	601.11	150.79	-75%	4,587,943	1,152,711	-3,435,232	-75%
		Car 1	20,711	20,711	0%	512.28	94.57	-82%	14,788,380	2,716,154	-12,072,226	-82%
		Car 2	58,794	58,794	0%	434.30	94.57	-79%	25,499,080	5,552,420	-19,946,660	-79%
		Car 3	69,031	69,031	0%	146.18	81.57	-35%	8,616,586	5,752,892	-2,863,694	-33%
		Car 4	159,183	159,183	0%	347.42	191.98	-41%	55,383,325	36,221,485	-19,161,840	-35%
		Car 5	165,866	165,866	0%	339.31	183.97	-46%	56,279,594	37,248,956	-19,030,638	-34%
	Diesel Oil	pre-Cars	489	489	0%	1086.23	1193.23	-6%	588,087	478,258	-109,829	-19%
		Car 1	147	147	0%	738.37	752.57	2%	188,232	110,953	-77,279	-41%
		Car 2	1,611	1,611	0%	629.67	646.57	-10%	1,271,445	1,041,621	-229,824	-18%
		Car 3	5,709	5,709	0%	733.67	455.75	-39%	3,885,261	2,623,779	-1,261,482	-33%
		Car 4	2,747	2,747	0%	473.92	242.84	-49%	1,382,041	969,434	-412,607	-30%
		Car 5	17,190	17,190	0%	362.91	186.64	-49%	6,219,175	3,180,791	-3,038,384	-49%
	LN ₂ Total	pre-Cars	52,939	52,939	0%	274.81	247.83	-10%	14,587,072	5,138,878	-9,448,194	-65%
		Car 5	3,140	3,140	0%	1034.98	737.35	-29%	3,250,020	2,370,443	-879,577	-27%
Diesel Oil	pre-Cars	989	989	0%	747.90	581.04	-23%	724,240	453,754	-270,486	-37%	
	Car 1	5,650	5,650	0%	817.42	581.04	-29%	3,734,343	2,288,967	-1,445,376	-39%	
	Car 2	16,377	16,377	0%	628.94	371.48	-41%	10,390,323	5,756,580	-4,633,743	-45%	
	Car 3	52,137	52,137	0%	396.86	269.43	-33%	3,225,679	3,689,320	1,666,348	52%	
	Car 4	185,213	185,213	0%	965.15	542.84	-44%	36,960,499	20,488,919	-16,471,580	-45%	
	Car 5	432,496	432,496	0%	72.98	154.92	110%	11,175,486	67,683,863	56,508,377	503%	
1.A.3.b.iii - Motorized Two-Wheelers (M2Ws)	Gasoline	pre-Cars	969,913	969,913	0%	153.35	169.17	-10%	95,380,780	100,893,736	5,512,956	6%
		Car 1	4,913	4,913	0%	125.89	164.79	31%	664,997	792,791	127,794	19%
		Car 2	2,835	2,835	0%	129.39	177.29	35%	355,496	582,589	227,093	64%
		Car 3	3,094	3,094	0%	119.23	180.86	67%	389,224	615,317	246,093	63%
		Car 4	6,082	6,082	0%	43.03	180.86	381%	284,284	1,193,617	909,333	319%
		Car 5	2,085	2,085	0%	21.68	180.86	817%	43,489	386,647	343,158	791%
	LN ₂ Total	pre-Cars	18,180	18,180	0%	86.95	186.83	115%	5,615,490	5,562,941	-52,549	-1%
		Car 5	2,262,080	2,262,080	0%	99.58	132.83	-23%	67,268,146	292,497,437	164,771,248	245%
	Road Transport	pre-Cars	2,262,080	2,262,080	0%	99.58	132.83	-23%	67,268,146	292,497,437	164,771,248	245%

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Adjustment 2014 (accepted) ^{8), 9)}	-105.6	-101.3	-95.7	-91.7						
Adjustment 2015 (accepted) ^{10), 11)}	-100.3	-95.5	-89.9	-85.1						
Adjustment 2016 (accepted) ^{12), 13)}	-151.3	-146.9	-145.1	-142.5	-128.1					
Adjustment 2017 (accepted) ¹⁴⁾	-151.3	-146.8	-145.0	-142.4	-127.2	-100.9				
Adjustment 2018 (accepted) ¹⁵⁾	-172.3	-174.5	-177.4	-180.4	-171.5	-148.9	-123.2			
Adjustment 2019 (accepted) ¹⁶⁾	-172.3	-174.5	-177.4	-180.3	-171.4	-148.8	-123.3	93.7		
Adjustment 2020 (accepted)	-297.8	-302.3	-301.3	-306.1	-294.5	-269.0	-244.3	-214.9	-174.6	
Adjustment 2021 (proposal)	-296.1	-300.7	-300.4	-305.2	-294.9	-274.9	-250.9	-221.1	-179.6	-144.8
Change against Adjustment 2020	1.7	1.6	0.9	0.9	-0.4	-5.9	-6.6	-6.2	-5.0	

The noticeable differences between the 2017 and 2018 adjustment proposals resulted from an ad-hoc revision of the *Handbook Emission Factors for Road Transport* (HBEFA, version 3.3) in the aftermath of the so-called "Diesel-gate". ¹⁷⁾

The even bigger changes between adjustment 2019 and adjustment proposal 2020 result from an additional rather fundamental revision of the *Handbook Emission Factors for Road Transport* now available in version 4.1 ¹⁸⁾ strongly effecting the TREMOD model underlying Germany's emission reporting for road transport and hence any adjustments of NO_x emissions. With such major model revision between submissions 2019 and 2020, the 2020 adjustment proposal differed significantly from the adjustment applied for and accepted in 2019.

In comparison to 2020, the TREMOD model applied for the 2021 submission has been revised only slightly in terms of NO_x emission factors. Hence, the 2021 adjustment proposal differs only slightly from the (accepted) proposal provided with submission 2020.

Adjustment description as provided in IIRs 2014 and 2015:

[image Description%20Adjustment%20DE-A%20-%20NOx%20from%201.A.3.b%20Road%20transport%20-%20IIRs%202014%20%26%202015.pdf](#)

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