

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). 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 2002⁵⁾, 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)⁶⁾.

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 in [%]	current	adjusted	difference in [%]	current	adjusted	adjustment	difference in [%]
1.A.3.b.i	gasoline	2010	795.957	795.957	0%	97.55	84.99	-13%	77.644.842	67.690.906	9.953.936	-13%
1.A.3.b.i	diesel oil	2010	629.380	629.380	0%	429.45	160.61	-63%	227.341.096	84.370.461	142.970.635	-63%
1.A.3.b.ii	gasoline	2010	6.325	6.325	0%	255.87	214.75	-16%	1.618.432	1.358.328	268.104	-16%
1.A.3.b.ii	diesel oil	2010	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	2010	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	2010	566.741	566.741	0%	446.67	271.83	-39%	253.148.243	154.956.160	99.892.083	-39%
1.A.3.b.iv	gasoline	2010	19.712	19.712	0%	113.68	188.43	65%	2.240.749	3.320.034	-1.079.285	-48%
1.A.3.b TOTAL			2.079.688	2.079.688	0%			0%	645.965.162	349.851.206	296.113.956	-46%
1.A.3.b.i	gasoline	2011	794.888	794.888	0%	92.09	81.61	-11%	73.185.851	64.851.951	8.333.900	-11%
1.A.3.b.i	diesel oil	2011	553.564	553.564	0%	434.12	159.22	-63%	240.313.791	88.138.959	152.174.832	-63%
1.A.3.b.ii	gasoline	2011	6.118	6.118	0%	229.35	198.67	-13%	1.403.081	1.214.776	188.305	-13%
1.A.3.b.ii	diesel oil	2011	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	2011	47.365	47.365	0%	592.65	448.99	-24%	28.071.221	21.266.323	6.804.898	-24%
1.A.3.b.iii	diesel oil	2011	563.891	563.891	0%	410.38	244.97	-40%	231.410.271	138.136.342	93.273.929	-40%
1.A.3.b.iv	gasoline	2011	19.289	19.289	0%	119.79	171.60	54%	2.137.002	3.299.162	-1.162.160	-54%
1.A.3.b TOTAL			2.106.883	2.106.883	0%			0%	632.365.736	331.625.655	300.740.081	-48%
1.A.3.b.i	gasoline	2012	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	2012	556.245	556.245	0%	435.96	158.66	-64%	242.082.902	88.696.699	153.386.203	-64%
1.A.3.b.ii	gasoline	2012	5.657	5.657	0%	218.93	183.15	-12%	1.238.620	1.092.662	145.958	-12%
1.A.3.b.ii	diesel oil	2012	114.390	114.390	0%	481.91	128.17	-75%	55.106.382	13.741.354	41.365.028	-75%
1.A.3.b.iii	gasoline	2012	50.902	50.902	0%	533.22	384.33	-28%	27.141.913	19.563.208	7.578.704	-28%
1.A.3.b.iii	diesel oil	2012	589.585	589.585	0%	381.33	224.00	-41%	234.829.180	132.064.753	92.764.428	-41%
1.A.3.b.iv	gasoline	2012	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			2.084.964	2.084.964	0%			0%	616.721.438	316.391.343	300.329.094	-49%
1.A.3.b.i	gasoline	2013	749.114	749.114	0%	89.35	74.85	-7%	69.190.007	66.071.797	3.118.211	-7%
1.A.3.b.i	diesel oil	2013	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	2013	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	2013	118.777	118.777	0%	480.60	114.93	-76%	57.003.633	13.690.488	43.313.145	-76%
1.A.3.b.iii	gasoline	2013	51.716	51.716	0%	509.64	369.09	-28%	26.350.969	18.620.843	7.730.126	-29%
1.A.3.b.iii	diesel oil	2013	600.139	600.139	0%	353.06	287.93	-19%	211.897.531	124.798.469	87.099.062	-41%
1.A.3.b.iv	gasoline	2013	18.229	18.229	0%	104.34	175.30	68%	1.902.688	3.197.038	-1.294.351	-68%
1.A.3.b TOTAL			2.132.683	2.132.683	0%			0%	616.079.663	318.854.371	297.224.692	-50%
1.A.3.b.i	gasoline	2014	752.526	752.526	0%	76.03	73.09	-4%	57.215.533	54.998.921	2.216.612	-4%
1.A.3.b.i	diesel oil	2014	626.845	626.845	0%	435.87	159.12	-63%	272.876.061	99.613.892	173.262.169	-63%
1.A.3.b.ii	gasoline	2014	5.845	5.845	0%	190.34	176.49	-7%	1.112.184	1.031.612	80.572	-7%
1.A.3.b.ii	diesel oil	2014	128.578	128.578	0%	475.66	118.96	-75%	61.546.575	14.267.237	47.279.338	-77%
1.A.3.b.iii	gasoline	2014	49.143	49.143	0%	468.37	339.99	-27%	23.017.116	16.708.234	6.308.881	-27%
1.A.3.b.iii	diesel oil	2014	672.754	672.754	0%	314.05	196.05	-38%	179.874.133	112.285.582	67.588.551	-38%
1.A.3.b.iv	gasoline	2014	18.673	18.673	0%	100.59	179.24	78%	1.070.294	3.346.794	-1.466.499	-78%
1.A.3.b TOTAL			2.153.563	2.153.563	0%			0%	597.120.297	362.252.271	234.868.025	-39%
1.A.3.b.i	gasoline	2015	715.156	715.156	0%	74.38	71.73	-4%	53.190.787	51.300.983	1.889.804	-4%
1.A.3.b.i	diesel oil	2015	645.565	645.565	0%	426.19	159.80	-63%	275.130.233	103.163.501	171.966.732	-63%
1.A.3.b.ii	gasoline	2015	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	2015	135.386	135.386	0%	469.35	187.96	-60%	63.605.443	14.607.490	48.997.953	-77%
1.A.3.b.iii	gasoline	2015	52.287	52.287	0%	458.96	327.99	-29%	23.997.617	17.149.448	6.848.170	-29%
1.A.3.b.iii	diesel oil	2015	589.411	589.411	0%	366.69	187.51	-49%	157.189.675	110.620.703	46.568.973	-30%
1.A.3.b.iv	gasoline	2015	18.459	18.459	0%	93.32	189.69	82%	1.833.382	3.334.472	-1.501.090	-82%
1.A.3.b TOTAL			2.161.376	2.161.376	0%			0%	575.931.265	361.877.596	214.053.670	-37%
1.A.3.b.i	gasoline	2016	715.272	715.272	0%	79.93	76.65	-4%	59.736.367	56.535.049	3.201.318	-5%
1.A.3.b.i	diesel oil	2016	675.119	675.119	0%	410.38	166.76	-61%	277.041.660	108.535.230	168.506.430	-61%
1.A.3.b.ii	gasoline	2016	5.926	5.926	0%	193.27	171.06	-12%	1.068.292	1.013.678	54.614	-5%
1.A.3.b.ii	diesel oil	2016	144.868	144.868	0%	456.12	185.62	-59%	65.712.732	15.216.007	50.496.725	-77%
1.A.3.b.iii	gasoline	2016	54.157	54.157	0%	424.73	388.24	-9%	23.002.109	16.693.117	6.308.992	-27%
1.A.3.b.iii	diesel oil	2016	594.813	594.813	0%	228.31	188.97	-18%	134.431.699	107.496.262	26.935.437	-20%
1.A.3.b.iv	gasoline	2016	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			2.207.339	2.207.339	0%			0%	553.199.558	362.901.820	190.297.738	-35%
1.A.3.b.i	gasoline	2017	724.571	724.571	0%	67.66	69.88	7%	49.026.074	50.634.714	-1.608.640	-3%
1.A.3.b.i	diesel oil	2017	696.592	696.592	0%	399.65	161.95	-59%	272.126.691	112.810.721	159.315.970	-59%
1.A.3.b.ii	gasoline	2017	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	2017	153.284	153.284	0%	424.66	183.89	-57%	65.093.930	15.925.216	49.168.714	-76%
1.A.3.b.iii	gasoline	2017	53.382	53.382	0%	379.80	288.71	-24%	19.793.901	15.304.828	4.489.073	-23%
1.A.3.b.iii	diesel oil	2017	596.263	596.263	0%	195.02	175.92	-10%	116.671.141	106.248.508	11.422.633	-10%
1.A.3.b.iv	gasoline	2017	19.180	19.180	0%	92.83	183.39	98%	1.778.674	3.513.787	-1.735.114	-98%
1.A.3.b TOTAL			2.251.437	2.251.437	0%			0%	525.549.410	364.489.986	161.059.424	-31%
1.A.3.b.i	gasoline	2018	699.027	699.027	0%	64.42	68.36	6%	45.032.966	47.786.817	-2.753.850	-6%
1.A.3.b.i	diesel oil	2018	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	2018	6.315	6.315	0%	158.22	169.11	7%	999.199	1.011.138	-11.939	-1%
1.A.3.b.ii	diesel oil	2018	154.259	154.259	0%	384.71	182.69	-53%	59.344.525	15.840.310	43.504.215	-73%
1.A.3.b.iii	gasoline	2018	51.634	51.634	0%	389.75	263.53	-32%	15.993.526	13.607.106	2.386.420	-15%
1.A.3.b.iii	diesel oil	2018	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	2018	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			2.180.993	2.180.993	0%			0%	478.758.266	291.139.612	187.618.654	-39%
1.A.3.b.i	gasoline	2019	704.691	704.691	0%	62.30	68.45	10%	43.901.941	48.238.026	-4.336.084	-10%
1.A.3.b.i	diesel oil	2019	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	2019	6.683	6.683	0%	148.08	153.25	5%	976.219	1.024.150	-47.931	-5%
1.A.3.b.ii	diesel oil	2019	169.183	169.183	0%	347.42	191.90	-44%	55.303.535	16.221.445	39.081.890	-71%
1.A.3.b.iii	gasoline	2019	52.939	52.939	0%	274.						

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 [t]		
1.A.3.a.i. Passenger Cars	Gasoline	pre-Cars	13,065	13,065	0%	584.75	514.25	-8%	7,965,060	6,996,917	-958,143	-12%
		Cars 1	36,541	36,541	0%	338.50	297.71	-8%	25,915,925	19,189,262	-7,726,663	-30%
		Cars 2	96,425	96,425	0%	172.95	136.03	-21%	16,980,020	13,020,026	-3,959,994	-23%
		Cars 3	133,139	133,139	0%	58.51	70.19	20%	7,790,384	9,343,433	1,553,029	20%
		Cars 4	444,991	444,991	0%	42.27	42.19	0%	18,911,389	18,173,529	-737,859	0%
		Cars 5	31,234	31,234	0%	18.61	42.19	127%	581,142	1,317,737	736,595	127%
	Cars 6	0	0	0%	25.08	42.19	67%	2	2	0	0%	
	Gasoline total	795,957	795,957	0%	377.55	344.39	-9%	77,644,842	67,456,585	-10,188,257	-13%	
	pre-Cars	13,138	13,138	0%	318.13	284.56	-9%	183,760	147,256	-36,504	-20%	
	Cars 1	10,388	10,388	0%	286.62	265.17	-7%	3,064,428	2,741,587	-322,841	-11%	
	Cars 2	50,088	50,088	0%	406.90	279.19	-31%	20,372,795	10,974,210	-9,398,584	-46%	
	Cars 3	134,025	134,025	0%	542.94	176.54	-67%	72,648,173	23,929,276	-48,718,897	-67%	
	Cars 4	279,154	279,154	0%	354.37	140.58	-60%	107,299,180	39,243,811	-68,055,369	-63%	
Cars 5	53,547	53,547	0%	434.70	140.58	-68%	23,276,735	7,527,796	-15,748,939	-68%		
Cars 6	334	334	0%	257.52	140.58	-45%	85,044	46,953	-38,091	-45%		
Diesel oil total	529,380	529,380	0%	429.45	140.58	-67%	227,341,096	84,970,481	-142,370,615	-67%		
PKs Total	1,325,337	1,325,337	0%	234.32	155.14	-34%	364,985,938	152,421,267	-212,564,670	-58%		
Gasoline	2,269	2,269	0%	627.39	642.95	7%	783,320	898,871	115,551	15%		
Cars 1	367	367	0%	861.35	297.39	-65%	384,969	186,020	-198,949	-51%		
Cars 2	5,293	5,293	0%	264.75	184.41	-30%	388,948	256,917	-132,031	-34%		
Cars 3	856	856	0%	82.47	90.63	10%	70,631	77,625	6,994	10%		
Cars 4	2,420	2,420	0%	36.32	44.90	24%	87,987	106,679	18,692	24%		
Cars 5	49	49	0%	15.34	44.90	193%	750	2,218	1,468	193%		
Cars 6	0	0	0%	0	0	0%	0	0	0	0%		
Gasoline total	6,345	6,345	0%	255.87	254.75	-5%	1,479,832	1,598,268	118,436	16%		
pre-Cars	4,876	4,876	0%	425.99	286.79	-33%	2,017,142	1,436,983	-580,239	-29%		
Cars 1	5,989	5,989	0%	395.19	276.24	-30%	2,269,095	1,289,020	-980,075	-43%		
Cars 2	13,126	13,126	0%	338.76	133.10	-60%	4,420,380	2,534,731	-1,885,649	-43%		
Cars 3	33,249	33,249	0%	531.01	150.58	-72%	17,655,883	5,086,780	-12,569,103	-72%		
Cars 4	54,581	54,581	0%	491.42	80.69	-84%	26,021,036	4,040,722	-21,980,314	-85%		
Cars 5	1,629	1,629	0%	427.50	80.69	-81%	696,296	144,434	-551,862	-79%		
Cars 6	0	0	0%	151.73	80.69	-47%	7	4	-3	-43%		
Diesel oil total	113,460	113,460	0%	476.34	134.99	-72%	54,083,533	15,311,584	-38,771,949	-72%		
LNWs Total	119,175	119,175	0%	464.70	139.19	-70%	55,658,986	16,689,853	-38,969,133	-70%		
Gasoline	3,382	3,382	0%	1036.25	1029.78	-0%	3,674,087	3,432,644	-241,443	-7%		
Cars 1	2,626	2,626	0%	749.41	732.14	-2%	2,117,871	2,126,595	7,723	0%		
Cars 2	10,152	10,152	0%	801.96	643.47	-20%	8,140,119	6,532,213	-1,607,906	-20%		
Cars 3	15,890	15,890	0%	633.22	437.25	-31%	13,066,776	7,289,299	-5,777,477	-44%		
Cars 4	5,461	5,461	0%	448.63	351.65	-21%	2,450,016	1,921,527	-528,489	-22%		
Cars 5	10,326	10,326	0%	337.28	182.33	-46%	2,482,417	1,082,644	-1,399,773	-56%		
Cars 6	0	0	0%	0	0	0%	0	0	0	0%		
Buses Total	48,044	48,044	0%	623.80	482.55	-23%	29,912,296	23,183,732	-6,728,564	-23%		
pre-Cars	10,185	10,185	0%	1040.10	787.37	-24%	10,510,623	7,754,130	-2,756,493	-26%		
Cars 1	5,677	5,677	0%	759.59	575.55	-24%	4,261,263	3,287,681	-973,582	-23%		
Cars 2	35,505	35,505	0%	817.62	524.79	-36%	31,525,526	20,224,679	-11,300,847	-36%		
Cars 3	168,223	168,223	0%	626.28	274.48	-56%	161,136,182	95,617,271	-65,518,911	-41%		
Cars 4	69,635	69,635	0%	358.94	280.62	-21%	27,183,867	20,166,636	-7,017,231	-26%		
Cars 5	283,934	283,934	0%	278.62	151.65	-45%	78,640,643	43,116,087	-35,524,556	-45%		
Cars 6	0	0	0%	0	0	0%	0	0	0	0%		
Trucks Total	566,141	566,141	0%	446.67	271.83	-39%	293,148,243	134,096,160	-159,052,083	-39%		
pre-Cars	7,973	7,973	0%	122.90	149.16	22%	372,721	1,189,353	2,186,924	23%		
Cars 1	5,231	5,231	0%	123.77	165.74	34%	647,479	887,039	239,560	34%		
Cars 2	3,587	3,587	0%	141.16	194.21	38%	585,352	696,661	111,309	38%		
Cars 3	2,920	2,920	0%	38.11	184.21	381%	116,198	657,032	432,834	381%		
Cars 4	0	0	0%	0	0	0%	0	0	0	0%		
Cars 5	0	0	0%	0	0	0%	0	0	0	0%		
MOVs Total	19,112	19,112	0%	113.68	168.43	48%	2,483,149	3,320,034	1,836,885	48%		
1.A.3.b. Road Transport Total	2,079,688	2,079,688	0%	218.62	168.23	-23%	645,965,162	349,851,296	-296,113,866	-46%		

Adjustment details for 2021

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 [t]		
1.A.3.a.i. Passenger Cars	Gasoline	pre-Cars	13,063	13,063	0%	592.96	534.68	-9%	7,728,235	6,979,435	-748,801	-10%
		Cars 1	61,979	61,979	0%	347.86	240.16	-31%	21,040,430	14,884,961	-6,155,469	-29%
		Cars 2	87,083	87,083	0%	179.38	136.68	-24%	15,829,983	11,883,782	-3,946,201	-25%
		Cars 3	124,330	124,330	0%	61.94	71.52	16%	7,683,881	8,891,671	1,207,790	16%
		Cars 4	442,185	442,185	0%	43.84	43.68	0%	19,384,914	19,376,439	-8,475	0%
		Cars 5	66,057	66,057	0%	18.58	43.68	135%	1,227,381	2,085,636	1,658,255	135%
	Cars 6	1	1	0%	25.06	43.68	68%	17	20	3	17%	
	Gasoline total	794,688	794,688	0%	522.09	471.65	-9%	73,183,851	64,851,851	-8,331,999	-11%	
	pre-Cars	1,711	1,711	0%	311.80	244.56	-21%	511,683	453,197	-58,486	-11%	
	Cars 1	8,426	8,426	0%	297.32	265.65	-9%	2,165,115	2,239,987	74,872	3%	
	Cars 2	42,514	42,514	0%	407.83	279.27	-32%	17,384,549	9,321,916	-8,062,633	-46%	
	Cars 3	121,429	121,429	0%	555.36	170.55	-69%	67,437,053	21,681,386	-45,755,667	-68%	
	Cars 4	264,943	264,943	0%	308.08	143.46	-53%	102,817,881	38,089,755	-64,728,126	-63%	
Cars 5	113,047	113,047	0%	435.12	143.46	-67%	49,536,960	16,332,974	-33,203,984	-67%		
Cars 6	695	695	0%	259.59	143.46	-45%	180,582	99,754	-80,828	-45%		
Diesel oil total	553,564	553,564	0%	434.52	159.92	-63%	249,713,191	88,136,959	-161,576,232	-65%		
PKs Total	1,348,252	1,348,252	0%	212.52	153.47	-28%	313,899,642	152,988,810	-160,910,832	-51%		
Gasoline	1,084	1,084	0%	626.25	646.96	7%	162,214	192,373	30,159	18%		
Cars 1	283	283	0%	818.74	584.47	-29%	243,289	86,158	-157,131	-64%		
Cars 2	5,184	5,184	0%	268.66	191.66	-29%	310,529	223,189	-87,340	-28%		
Cars 3	783	783	0%	65.97	65.39	1%	67,320	74,782	7,461	11%		
Cars 4	2,562	2,562	0%	37.38	46.61	24%	95,786	119,162	23,376	24%		
Cars 5	241	241	0%	16.13	46.61	188%	3,082	11,190	7,308	188%		
Cars 6	0	0	0%	15.33	46.61	283%	1	3	2	203%		
Gasoline total	6,178	6,178	0%	229.35	186.52	-23%	1,483,081	1,254,776	-228,305	-15%		
pre-Cars	3,395	3,395	0%	425.99	286.79	-33%	1,989,280	1,225,862	-763,418	-38%		
Cars 1	4,787	4,787	0%	395.71	276.24	-30%	1,994,360	1,030,426	-963,934	-48%		
Cars 2	10,910	10,910	0%	336.90	133.29	-60%	3,644,582	2,091,883	-1,552,699	-43%		
Cars 3	28,076	28,076	0%	541.53	150.54	-72%	15,037,240	4,346,870	-10,690,370	-72%		
Cars 4	60,832	60,832	0%	493.82	80.25	-84%	30,039,914	5,429,011	-24,610,904	-82%		
Cars 5	6,669	6,669	0%	448.95	80.25	-82%	2,930,190	594,364	-2,335,826	-80%		
Cars 6	0	0	0%	154.21	80.25	-48%	16	6	-10	-63%		
Diesel oil total	115,967	115,967	0%	491.55	126.90	-74%	55,844,519	14,716,142	-41,128,376	-74%		
LNWs Total	122,085	122,085	0%	468.92	130.95	-72%	57,247,599	15,932,898	-41,314,701	-72%		

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	
		kg [t]	kg [t]	%	in [g/t]	in [g/t]	in [%]	in [kg]	in [kg]	in [kg]	in [%]	
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	11,541	11,541	0%	607.72	636.38	-6%	7,035,041	6,189,786	-836,256	-12%
		Car 1	47,487	47,487	0%	349.56	341.60	-2%	16,571,746	11,426,129	-5,145,617	-31%
		Car 2	72,781	72,781	0%	164.27	137.82	-16%	13,487,749	10,035,380	-3,452,369	-26%
		Car 3	189,443	189,443	0%	63.99	72.62	14%	6,927,963	7,875,172	947,209	14%
		Car 4	488,541	488,541	0%	45.29	45.13	0%	18,541,881	18,436,736	-105,145	-1%
		Car 5	181,961	181,961	0%	18.61	45.13	143%	1,887,356	4,681,311	2,793,954	143%
	Car 6	282	282	0%	25.06	45.13	78%	7,339	42,736	35,397	74%	
	Gasoline total	790,957	790,957	0%	85.73	78.80	-9%	64,379,943	58,577,229	-5,802,715	-9%	
	pre-Cars	1,487	1,487	0%	311.88	284.56	-9%	483,963	283,927	-199,037	-41%	
	Car 1	4,450	4,450	0%	297.79	286.44	-4%	1,980,364	1,717,387	-262,977	-13%	
	Car 2	33,957	33,957	0%	406.82	279.27	-31%	13,987,432	7,445,646	-6,541,787	-46%	
	Car 3	183,539	183,539	0%	564.82	170.63	-69%	58,389,037	10,434,837	-47,954,200	-82%	
	Car 4	234,943	234,943	0%	398.41	146.46	-63%	91,724,188	34,488,987	-57,235,201	-62%	
	Car 5	173,112	173,112	0%	434.89	146.45	-66%	75,284,364	25,353,375	-49,930,989	-66%	
	Car 6	1,557	1,557	0%	259.84	146.45	-44%	484,664	220,086	-264,578	-54%	
	Diesel Oil total	555,245	555,245	0%	415.96	158.66	-62%	242,962,982	88,096,489	-154,866,493	-64%	
	PKs Total	1,386,202	1,386,202	0%	234.91	152.29	-35%	386,442,896	146,673,507	-239,769,389	-62%	
	pre-Cars	962	962	0%	632.28	640.56	1%	487,779	621,160	133,381	27%	
	Car 1	232	232	0%	803.24	383.22	-52%	189,986	70,299	-119,687	-61%	
	Car 2	989	989	0%	271.36	195.74	-28%	268,154	183,586	-84,568	-31%	
	Car 3	835	835	0%	89.38	98.33	10%	74,623	82,082	7,459	10%	
	Car 4	2,030	2,030	0%	38.49	47.58	24%	75,155	96,611	21,456	29%	
Car 5	610	610	0%	16.36	47.58	182%	3,941	29,011	25,070	192%		
Car 6	0	0	0%	15.37	47.58	210%	2	6	4	210%		
Gasoline total	5,657	5,657	0%	218.93	193.15	-9%	1,238,520	1,092,847	-145,673	-12%		
pre-Cars	3,281	3,281	0%	424.46	386.79	-9%	1,368,754	982,083	-386,671	-28%		
Car 1	3,656	3,656	0%	399.34	276.24	-30%	1,445,983	787,034	-658,949	-46%		
Car 2	8,479	8,479	0%	336.46	193.38	-42%	2,882,325	1,629,772	-1,252,553	-43%		
Car 3	23,785	23,785	0%	358.53	150.44	-58%	13,050,281	3,586,082	-9,464,199	-73%		
Car 4	59,485	59,485	0%	494.22	80.85	-84%	29,389,078	5,337,395	-24,051,683	-82%		
Car 5	15,984	15,984	0%	442.70	80.85	-82%	7,040,461	1,420,906	-5,619,555	-80%		
Car 6	1	1	0%	151.94	80.85	-47%	122	72	-50	-41%		
Diesel Oil total	114,350	114,350	0%	485.91	120.17	-75%	55,186,382	13,741,354	-41,445,028	-75%		
LNPs Total	120,088	120,088	0%	409.51	123.85	-70%	56,344,983	14,834,696	-41,510,287	-74%		
pre-Cars	1,326	1,326	0%	1091.46	1319.46	21%	1,410,640	1,382,283	-28,357	-2%		
Car 1	1,248	1,248	0%	727.34	751.15	3%	987,476	937,184	-50,292	-5%		
Car 2	7,780	7,780	0%	783.46	643.34	-18%	6,085,091	4,997,478	-1,087,613	-18%		
Car 3	14,483	14,483	0%	629.94	437.61	-31%	9,073,197	6,089,744	-2,983,453	-33%		
Car 4	5,331	5,331	0%	468.50	361.85	-23%	2,642,179	1,876,777	-765,402	-29%		
Car 5	30,752	30,752	0%	347.84	182.99	-47%	7,218,643	3,787,467	-3,431,176	-47%		
Car 6	73	73	0%	64.52	182.99	284%	3,961	13,296	9,334	236%		
Diesel Total	30,982	30,982	0%	533.28	384.33	-28%	27,141,913	19,948,288	-7,193,625	-26%		
pre-Cars	6,922	6,922	0%	1036.55	758.82	-27%	7,107,543	5,252,348	-1,855,195	-26%		
Car 1	3,630	3,630	0%	749.70	570.57	-24%	2,721,326	2,071,111	-650,215	-24%		
Car 2	23,577	23,577	0%	818.27	536.43	-34%	19,820,253	12,175,855	-7,644,398	-38%		
Car 3	86,726	86,726	0%	634.65	370.21	-42%	61,287,137	35,848,686	-25,438,451	-42%		
Car 4	50,650	50,650	0%	356.50	280.44	-21%	19,982,680	14,880,877	-5,101,803	-26%		
Car 5	485,981	485,981	0%	261.24	152.32	-42%	116,149,956	61,626,577	-54,523,379	-47%		
Car 6	2,380	2,380	0%	188.467	360.323	191%	188,467	360,323	171,856	223%		
Diesel Total	389,585	389,585	0%	385.33	224.69	-42%	224,829,180	132,064,733	-92,764,447	-42%		
pre-Cars	6,780	6,780	0%	122.76	151.03	23%	822,530	1,011,520	188,990	23%		
Car 1	4,386	4,386	0%	134.81	171.39	26%	536,615	738,050	201,435	38%		
Car 2	3,287	3,287	0%	136.22	184.95	43%	445,087	636,853	191,766	43%		
Car 3	3,994	3,994	0%	39.66	184.95	382%	158,286	778,676	620,390	392%		
Car 4	0	0	0%	0	0	0%	0	0	0	0%		
Car 5	0	0	0%	0	0	0%	0	0	0	0%		
MOWs Total	18,288	18,288	0%	167.41	175.28	5%	1,982,548	3,183,438	1,200,890	61%		
1.A.3.b - Road Transport	Total	2,084,964	2,084,964	0%	295.79	151.71	-49%	616,721,438	296,381,343	-320,340,095	-48%	

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	
		kg [t]	kg [t]	%	in [g/t]	in [g/t]	in [%]	in [kg]	in [kg]	in [kg]	in [%]	
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	11,480	11,480	0%	618.27	639.35	-6%	7,011,641	5,967,452	-1,044,189	-15%
		Car 1	37,743	37,743	0%	363.78	341.68	-12%	13,362,986	9,129,486	-4,233,501	-32%
		Car 2	62,680	62,680	0%	189.93	139.33	-27%	11,889,922	8,722,284	-3,167,638	-27%
		Car 3	97,792	97,792	0%	68.38	73.19	9%	6,491,618	7,156,920	665,302	10%
		Car 4	387,911	387,911	0%	47.22	46.52	-1%	18,790,345	18,889,937	99,592	1%
		Car 5	138,863	138,863	0%	18.68	46.52	150%	2,583,150	6,439,691	3,856,541	150%
	Car 6	2,714	2,714	0%	25.99	46.52	79%	70,626	126,237	55,611	79%	
	Gasoline total	748,116	748,116	0%	88.35	74.85	-16%	69,190,887	56,071,797	-13,119,090	-19%	
	pre-Cars	987	987	0%	131.26	264.56	-51%	413,081	248,138	-164,943	-40%	
	Car 1	4,626	4,626	0%	268.42	266.79	-1%	1,678,472	1,680,686	2,214	0%	
	Car 2	28,437	28,437	0%	408.64	275.91	-33%	11,963,522	6,253,531	-5,709,991	-48%	
	Car 3	82,795	82,795	0%	574.33	170.67	-70%	53,284,956	16,979,373	-36,305,583	-68%	
	Car 4	222,583	222,583	0%	393.55	149.27	-62%	87,598,471	33,225,586	-54,372,885	-62%	
	Car 5	233,766	233,766	0%	435.42	149.27	-66%	181,787,275	34,884,758	-146,902,517	-81%	
	Car 6	4,536	4,536	0%	259.53	149.27	-42%	1,177,151	677,645	-499,506	-42%	
	Diesel Oil total	589,131	589,131	0%	437.54	198.71	-54%	257,533,128	83,899,698	-173,633,430	-64%	
	PKs Total	1,338,247	1,338,247	0%	217.62	111.77	-49%	317,723,735	146,971,495	-170,752,240	-54%	
	pre-Cars	184	184	0%	831.81	646.96	-22%	968,320	729,253	-239,067	-25%	
	Car 1	836	836	0%	274.42	291.18	7%	229,520	189,285	-40,235	-18%	
	Car 2	784	784	0%	82.06	191.79	23%	72,691	79,780	7,089	10%	
	Car 3	1,089	1,089	0%	43.70	48.89	11%	77,284	82,833	5,549	7%	
	Car 4	966	966	0%	16.67	48.89	192%	16,187	47,268	31,081	192%	
Car 5	1	1	0%	17.68	48.89	176%	26	72	46	176%		
Gasoline total	5,578	5,578	0%	262.86	184.67	-30%	1,131,289	1,026,727	-104,562	-9%		
pre-Cars	2,754	2,754	0%	424.37	286.79	-33%	1,988,757	944,928	-1,043,829	-53%		
Car 1	2,948	2,948	0%	399.75	276.25	-30%	1,186,782	634,568	-552,214	-46%		
Car 2	6,982	6,982	0%	338.82	193.38	-42%	2,246,147	1,350,074	-896,073	-40%		
Car 3	20,421	20,421	0%	568.12	150.38	-73%	11,437,995	3,070,913	-8,367,082	-73%		
Car 4	55,887	55,887	0%	497.72	90.45	-82%	27,735,440	5,048,416	-22,687,024	-82%		
Car 5	29,024	29,024	0%	441.97	90.45	-80%	13,181,325	2,687,664	-10,493,661	-80%		
Car 6	41	41	0%	151.26	90.45	-40%	6,160	3,688	-2,472	-40%		
Diesel Oil total	118,777	118,777	0%	488.66	114.93	-76%	57,083,513	13,656,488	-43,427,025	-76%		
LNPs Total	124,354	124,354	0%	464.54	198.03	-57%	58,214,422	14,677,275	-43,5			

Adjustment details for 2024

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	difference	
		kg [t]	kg [t]	%	kg [t]	kg [t]	%	kg [t]	kg [t]	kg [t]	kg [t]	
1.A.3.a.i. Passenger Cars	Gasoline	pre-Cars	11,647	11,647	0%	612.37	644.11	-11%	7,132,688	6,337,484	-796,844	-11%
		Car 1	30,667	30,667	0%	368.77	343.93	-32%	11,082,246	7,480,541	-3,621,706	-32%
		Car 2	53,486	53,486	0%	196.58	140.31	-29%	10,514,477	7,584,432	-2,930,046	-29%
		Car 3	87,374	87,374	0%	65.31	73.93	7%	8,955,585	6,455,737	-4,042,218	-7%
		Car 4	387,159	387,159	0%	45.16	47.80	-5%	19,059,585	16,536,009	-2,523,577	-13%
		Car 5	171,270	171,270	0%	18.59	47.80	151%	3,183,282	0,187,581	-5,004,209	151%
	Car 6	10,316	10,316	0%	25.97	47.80	84%	267,859	433,036	225,246	84%	
	Gasoline total	752,526	752,526	0%	76.33	73.89	4%	57,215,533	54,596,501	-2,616,812	4%	
	pre-Cars	1,341	1,341	0%	311.73	284.66	-9%	4,117,967	354,246	-42,732	-9%	
	Car 1	4,082	4,082	0%	298.92	287.29	-11%	1,482,284	1,387,643	-156,951	-11%	
	Car 2	23,934	23,934	0%	408.71	320.45	-40%	9,734,484	5,276,430	-4,458,054	-40%	
	Car 3	82,749	82,749	0%	585.53	176.81	-49%	48,451,830	14,796,249	-33,655,589	-49%	
	Car 4	211,237	211,237	0%	397.27	151.77	-62%	83,917,680	32,059,973	-51,857,708	-62%	
	Car 5	285,011	285,011	0%	436.38	151.77	-65%	124,721,396	43,370,300	-81,343,096	-65%	
	Car 6	16,081	16,081	0%	259.34	151.77	-41%	4,170,580	2,440,686	-1,729,814	-41%	
	Diesel oil total	626,045	626,045	0%	415.87	159.12	-62%	272,876,061	89,643,892	-173,262,169	-62%	
	Px Total	1,378,571	1,378,571	0%	218.44	152.15	-31%	338,091,584	154,632,833	-175,478,761	-31%	
	pre-Cars	386	386	0%	638.14	646.36	2%	1,683,683	1,726,734	43,051	2%	
	Car 1	173	173	0%	868.27	389.98	-44%	160,074	53,576	-86,499	-44%	
	Car 2	748	748	0%	284.73	287.11	-21%	212,980	154,839	-58,129	-21%	
	Car 3	771	771	0%	58.02	185.21	7%	35,982	81,070	5,878	7%	
Car 4	1,087	1,087	0%	43.47	50.15	15%	81,139	83,618	12,479	15%		
Car 5	1,374	1,374	0%	17.11	50.15	183%	23,517	68,918	45,401	183%		
Car 6	17	17	0%	18.08	50.15	179%	212	670	637	179%		
Gasoline total	5,845	5,845	0%	196.34	176.49	-2%	1,112,584	1,031,652	-80,932	-2%		
pre-Cars	2,537	2,537	0%	428.18	386.79	-21%	1,985,979	1,706,259	-287,599	-21%		
Car 1	2,589	2,589	0%	393.82	276.25	-40%	987,136	639,888	-447,328	-40%		
Car 2	6,087	6,087	0%	338.81	133.25	-42%	1,985,985	1,180,889	-805,128	-42%		
Car 3	18,230	18,230	0%	571.75	150.58	-24%	10,417,076	2,742,056	-7,675,020	-24%		
Car 4	52,361	52,361	0%	459.70	91.69	-42%	26,184,486	4,703,784	-21,484,748	-42%		
Car 5	46,749	46,749	0%	438.64	91.69	-29%	20,496,234	4,250,626	-16,237,709	-29%		
Car 6	187	187	0%	151.18	91.69	-40%	29,829	17,974	-11,855	-40%		
Diesel oil total	128,578	128,578	0%	415.56	170.94	-27%	61,146,525	34,267,237	-26,879,318	-27%		
LNx Total	134,423	134,423	0%	463.56	153.85	-35%	62,299,180	25,298,849	-46,998,311	-35%		
pre-Cars	984	984	0%	1059.49	1919.23	82%	1,062,384	1,062,321	-63	82%		
Car 1	837	837	0%	728.32	170.99	2%	659,222	628,359	18,127	2%		
Car 2	5,598	5,598	0%	704.35	643.67	-9%	4,384,320	3,823,441	-560,879	-9%		
Car 3	11,221	11,221	0%	621.20	458.38	-21%	7,082,740	5,143,628	-1,939,220	-21%		
Car 4	4,278	4,278	0%	461.90	361.79	-21%	1,972,610	1,084,978	-887,632	-21%		
Car 5	32,042	32,042	0%	368.55	183.99	-40%	7,726,911	4,065,632	-3,661,279	-40%		
Car 6	4,182	4,182	0%	42.78	183.99	330%	178,913	789,476	610,563	330%		
Buses Total	49,143	49,143	0%	468.37	339.99	-27%	23,017,115	16,788,234	-6,228,881	-27%		
pre-Cars	4,782	4,782	0%	1034.34	737.35	-29%	4,945,942	3,525,888	-1,420,134	-29%		
Car 1	2,295	2,295	0%	748.66	581.41	-22%	1,600,088	1,237,759	-412,849	-22%		
Car 2	13,023	13,023	0%	817.30	510.28	-38%	11,146,969	6,955,738	-4,191,151	-38%		
Car 3	54,085	54,085	0%	632.52	384.41	-42%	36,589,677	19,927,835	-14,661,841	-42%		
Car 4	36,037	36,037	0%	396.37	285.34	-30%	13,481,100	9,711,686	-3,779,422	-30%		
Car 5	389,263	389,263	0%	262.82	153.66	-40%	110,112,782	69,680,643	-40,432,148	-40%		
Car 6	34,214	34,214	0%	63.95	153.66	189%	3,937,089	11,368,962	7,421,413	189%		
Trucks Total	572,154	572,154	0%	314.85	196.65	-38%	179,814,133	112,285,862	-67,588,551	-38%		
pre-Cars	8,185	8,185	0%	122.85	158.04	29%	795,185	974,388	218,152	29%		
Car 1	3,837	3,837	0%	134.71	174.84	40%	478,514	670,859	192,346	40%		
Car 2	3,385	3,385	0%	128.34	196.25	52%	433,874	680,370	226,504	52%		
Car 3	5,385	5,385	0%	38.53	196.25	386%	209,722	1,041,189	831,467	386%		
Car 4	0	0	0%	0	0	0%	0	0	0	0%		
Car 5	0	0	0%	0	0	0%	0	0	0	0%		
MOWs Total	18,673	18,673	0%	108.59	176.84	78%	1,828,294	3,348,734	1,488,489	78%		
1.A.3.b. Road Transport Total		2,153,563	2,153,563	0%	277.27	140.35	-48%	597,128,287	382,252,271	-214,886,825	-48%	

Adjustment details for 2025

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	difference	
		kg [t]	kg [t]	%	kg [t]	kg [t]	%	kg [t]	kg [t]	kg [t]	kg [t]	
1.A.3.a.i. Passenger Cars	Gasoline	pre-Cars	11,380	11,380	0%	623.23	644.11	-4%	7,266,112	6,191,842	-1,074,269	-14%
		Car 1	36,112	36,112	0%	371.34	345.71	-34%	8,963,681	5,924,574	-3,029,228	-34%
		Car 2	42,525	42,525	0%	267.78	142.68	-32%	8,918,785	6,089,659	-2,829,126	-32%
		Car 3	72,871	72,871	0%	73.96	74.74	1%	5,381,361	5,446,237	64,887	1%
		Car 4	363,474	363,474	0%	52.38	49.82	-6%	18,485,637	17,326,221	-1,159,416	-6%
		Car 5	180,783	180,783	0%	19.11	49.82	151%	3,454,481	0,881,456	-5,408,575	151%
	Car 6	29,612	29,612	0%	25.70	49.82	84%	790,791	1,451,483	660,752	84%	
	Gasoline total	715,156	715,156	0%	74.38	71.73	4%	53,198,187	51,280,983	-1,888,895	4%	
	pre-Cars	329	329	0%	319.32	284.66	-9%	1,071,913	1,239,733	167,820	9%	
	Car 1	4,279	4,279	0%	298.14	287.84	-9%	1,261,930	1,129,989	-132,821	-9%	
	Car 2	19,689	19,689	0%	407.80	320.98	-40%	8,013,687	4,338,178	-3,674,788	-40%	
	Car 3	71,044	71,044	0%	595.81	179.04	-70%	42,271,648	12,719,962	-29,551,686	-70%	
	Car 4	182,410	182,410	0%	401.42	154.07	-62%	77,237,055	29,644,450	-47,592,605	-62%	
	Car 5	364,346	364,346	0%	434.67	154.07	-65%	132,290,453	46,080,424	-86,209,029	-65%	
	Car 6	52,576	52,576	0%	259.76	154.07	-41%	13,657,082	6,180,384	-6,536,778	-41%	
	Diesel oil total	645,565	645,565	0%	426.19	159.88	-62%	275,138,233	183,163,501	-91,965,232	-62%	
	Px Total	1,360,721	1,360,721	0%	245.28	153.52	-37%	308,337,020	154,444,484	-173,896,536	-37%	
	pre-Cars	150	150	0%	895.83	911.93	4%	134,523	46,851	-87,672	-4%	
	Car 1	629	629	0%	298.27	212.94	-29%	187,533	133,879	-53,654	-29%	
	Car 2	781	781	0%	105.50	188.62	7%	73,969	76,155	2,186	7%	
	Car 3	1,720	1,720	0%	47.98	51.30	6%	80,968	80,248	-720	6%	
Car 4	1,620	1,620	0%	18.41	51.30	179%	29,012	83,086	53,274	179%		
Car 5	84	84	0%	18.71	51.30	174%	1,752	4,884	3,182	174%		
Gasoline total	5,783	5,783	0%	187.52	172.88	8%	1,083,507	1,080,999	-2,508	8%		
pre-Cars	2,323	2,323	0%	418.31	386.79	-20%	986,186	712,531	-253,854	-20%		
Car 1	2,186	2,186	0%	391.47	276.25	-40%	824,270	453,227	-371,843	-40%		
Car 2	5,025	5,025	0%	324.81	133.25	-40%	1,632,296	971,286	-661,028	-40%		
Car 3	15,781	15,781	0%	588.35	150.67	-24%	9,112,414	2,385,713	-6,748,701	-24%		
Car 4	47,480	47,480	0%	501.73	91.74	-82%	23,782,396	4,348,288	-19,434,098	-82%		
Car 5	62,116	62,116	0%	426.13	91.74	-79%	27,090,214	5,680,295	-21,393,899	-79%		
Car 6	635	635	0%	154.91	91.74	-40%	87,760	88,230	470	-40%		
Diesel oil total	135,386	135,386	0%	468.35	187.96	-27%	63,565,643	34,687,486	-28,878,153	-27%		
LNx Total	141,098	141,098	0%	497.76								

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 [kg]	in [kg]	in [t]	
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	11,782	11,782	0%	634.75	644.11	-14%	7,470,914	6,410,967	-1,059,947
		Car 1	20,270	20,270	0%	372.25	241.68	-35%	7,545,483	4,986,688	-2,558,795
		Car 2	36,062	36,062	0%	212.73	143.11	-33%	7,671,581	5,160,897	-2,510,684
		Car 3	63,039	63,039	0%	78.17	75.59	-3%	4,861,482	4,739,259	-122,223
		Car 4	334,413	334,413	0%	53.74	50.17	-7%	17,963,904	16,777,445	-1,186,459
		Car 5	183,374	183,374	0%	19.09	50.17	163%	3,580,746	9,139,634	5,558,888
	Gasoline total	715,272	715,272	0%	78.03	70.65	-9%	58,736,967	50,535,649	-8,201,318	
	pre-Cars	1,280	1,280	0%	304.78	254.56	-17%	386,262	339,172	-47,090	
	Car 1	3,749	3,749	0%	294.36	260.66	-11%	1,222,449	1,011,626	-210,823	
	Car 2	16,584	16,584	0%	407.19	221.43	-46%	6,720,132	3,663,964	-3,056,168	
	Car 3	61,398	61,398	0%	602.50	179.24	-70%	36,991,999	11,085,649	-25,906,350	
	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	116,034	116,034	0%	268.78	156.24	-42%	30,427,555	19,232,785	-11,194,770		
Diesel Oil total	675,119	675,119	0%	410.36	160.76	-61%	277,941,660	188,535,230	-89,406,430		
FCs Total	1,390,391	1,390,391	0%	235.75	154.41	-35%	527,738,627	359,070,879	-168,667,748		
1.A.3.a.ii - Light Duty Vehicles (LDV)	Gasoline	pre-Cars	970	970	0%	602.79	640.36	-6%	583,785	587,583	-3,798
		Car 1	136	136	0%	808.31	512.18	-37%	122,129	42,425	-79,704
		Car 2	540	540	0%	308.39	217.84	-30%	162,311	117,197	-45,114
		Car 3	650	650	0%	108.43	111.57	3%	70,432	72,731	2,299
		Car 4	1,684	1,684	0%	49.06	52.36	7%	75,714	84,033	8,319
		Car 5	1,724	1,724	0%	19.82	52.36	164%	34,157	80,258	46,101
	Gasoline total	5,596	5,596	0%	389.27	171.66	-56%	1,968,292	1,693,679	-274,613	
	pre-Cars	2,189	2,189	0%	414.87	286.79	-31%	899,649	685,433	-214,216	
	Car 1	1,790	1,790	0%	391.89	276.25	-29%	780,169	585,371	-194,798	
	Car 2	4,223	4,223	0%	323.43	193.71	-40%	1,365,994	876,452	-489,542	
	Car 3	13,582	13,582	0%	588.91	150.77	-74%	6,084,323	2,049,233	-4,035,090	
	Car 4	43,141	43,141	0%	504.68	92.49	-82%	21,783,989	3,986,141	-17,797,848	
	Car 5	74,231	74,231	0%	434.16	92.49	-79%	32,223,283	6,658,790	-25,564,493	
Car 6	4,921	4,921	0%	153.69	92.49	-40%	755,285	454,676	-300,609		
Diesel Oil total	148,068	148,068	0%	454.12	185.62	-59%	65,712,732	32,296,087	-33,416,645		
LDVs Total	148,068	148,068	0%	454.12	185.62	-59%	65,712,732	32,296,087	-33,416,645		
1.A.3.b.i - Heavy Duty Vehicles (HDV)	Diesel Oil	pre-Cars	891	891	0%	1076.87	1319.23	-18%	964,197	989,234	-25,037
		Car 1	571	571	0%	731.87	732.27	0%	433,675	446,226	-12,551
		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	1,586,881	-530,338
		Car 5	34,380	34,380	0%	364.38	186.22	-49%	8,935,974	4,617,617	-4,318,357
	Diesel Oil total	54,915	54,915	0%	624.73	388.24	-37%	23,082,189	16,835,117	-6,247,072	
	pre-Cars	3,933	3,933	0%	1034.87	737.35	-29%	4,087,249	2,980,379	-1,106,870	
	Car 1	1,555	1,555	0%	748.16	587.92	-23%	1,163,482	789,813	-373,669	
	Car 2	8,076	8,076	0%	817.75	585.52	-29%	7,255,045	4,486,620	-2,768,425	
	Car 3	34,167	34,167	0%	630.81	588.64	-8%	21,553,289	12,251,155	-9,302,134	
	Car 4	34,287	34,287	0%	396.94	281.86	-29%	9,640,364	6,685,621	-2,954,743	
	Car 5	269,735	269,735	0%	267.22	153.89	-43%	74,680,233	39,676,610	-35,003,623	
Trucks Total	261,480	261,480	0%	671.77	153.89	-77%	16,149,288	40,244,036	24,094,748		
Trucks Total	954,013	954,013	0%	226.31	180.97	-20%	134,031,899	101,496,262	-32,535,637		
1.A.3.b.ii - Motorized Two-Wheelers (MOW)	Gasoline	pre-Cars	5,543	5,543	0%	125.59	155.78	24%	696,072	863,299	167,227
		Car 1	3,360	3,360	0%	107.11	177.29	63%	407,113	585,796	178,683
		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	1,273,571	1,063,944
		Car 4	66	66	0%	17.47	187.68	1031%	1,134	12,822	11,688
		Car 5	0	0	0%	0.00	187.68				
	MOWs Total	16,185	16,185	0%	96.14	181.68	89%	1,985,897	3,432,476	1,446,579	
	1.A.3.b. - Road Transport Total	2,287,339	2,287,339	0%	258.89	137.22	-46%	553,789,558	382,981,820	-170,807,738	

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 [kg]	in [kg]	in [t]	
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	12,282	12,282	0%	636.73	644.11	-14%	7,814,287	6,648,187	-1,166,100
		Car 1	17,449	17,449	0%	372.99	241.68	-35%	6,588,911	4,217,044	-2,371,867
		Car 2	30,435	30,435	0%	217.43	147.75	-32%	6,617,570	4,714,140	-1,903,430
		Car 3	54,271	54,271	0%	78.48	76.27	-3%	4,254,938	4,139,376	-115,562
		Car 4	315,085	315,085	0%	54.96	51.25	-7%	17,315,320	16,151,861	-1,163,459
		Car 5	180,240	180,240	0%	19.17	51.25	163%	3,485,382	9,239,815	5,754,433
	Gasoline total	746,371	746,371	0%	67.66	60.88	-10%	59,096,874	50,534,714	-8,562,160	
	pre-Cars	760	760	0%	304.39	254.56	-17%	244,983	247,620	-2,637	
	Car 1	3,360	3,360	0%	294.17	271.67	-7%	1,082,266	910,182	-172,084	
	Car 2	13,788	13,788	0%	407.17	222.43	-45%	5,914,130	3,066,983	-2,847,147	
	Car 3	52,128	52,128	0%	608.95	179.65	-70%	31,686,478	9,384,788	-22,301,690	
	Car 4	157,947	157,947	0%	418.10	156.34	-63%	64,733,485	24,929,323	-39,804,162	
	Car 5	283,480	283,480	0%	423.99	156.34	-63%	120,157,656	44,873,190	-75,284,466	
Car 6	184,760	184,760	0%	262.61	156.34	-40%	48,521,183	29,250,985	-19,270,198		
Diesel Oil total	696,582	696,582	0%	396.65	161.95	-59%	272,126,081	152,890,721	-119,235,360		
FCs Total	1,442,953	1,442,953	0%	225.98	155.69	-31%	521,152,965	358,425,435	-162,727,530		
1.A.3.a.ii - Light Duty Vehicles (LDV)	Gasoline	pre-Cars	980	980	0%	611.81	640.36	-6%	612,242	606,978	-5,264
		Car 1	124	124	0%	808.23	512.18	-37%	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	4%	65,955	68,012	2,057
		Car 4	1,476	1,476	0%	58.72	53.38	-9%	74,877	78,816	3,939
		Car 5	1,660	1,660	0%	21.73	53.38	146%	36,240	89,034	52,794
	Gasoline total	6,186	6,186	0%	375.55	167.18	-56%	1,958,799	1,634,211	-324,588	
	pre-Cars	2,087	2,087	0%	411.41	286.79	-30%	860,499	631,183	-229,316	
	Car 1	1,538	1,538	0%	396.47	276.25	-30%	660,716	511,158	-149,558	
	Car 2	3,580	3,580	0%	321.26	193.04	-40%	1,143,793	687,293	-456,501	
	Car 3	11,084	11,084	0%	596.09	150.79	-75%	6,940,879	1,758,147	-5,182,732	
	Car 4	39,050	39,050	0%	506.70	93.69	-82%	19,789,647	3,635,035	-16,154,612	
	Car 5	75,789	75,789	0%	432.66	93.69	-79%	32,790,966	7,054,565	-25,736,401	
Car 6	19,625	19,625	0%	151.71	93.69	-39%	2,977,439	1,626,876	-1,350,563		
Diesel Oil total	153,284	153,284	0%	424.66	183.89	-57%	65,093,930	32,926,276	-32,167,654		
LDVs Total	153,284	153,284	0%	424.66	183.89	-57%	65,093,930	32,926,276	-32,167,654		
1.A.3.b.i - Heavy Duty Vehicles (HDV)	Diesel Oil	pre-Cars	736	736	0%	1077.33	1319.23	-18%	790,259	790,425	-166
		Car 1	411	411	0%	731.87	732.27	0%	389,684	389,862	-178
		Car 2	485	485	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	1,586,881	-530,338
		Car 5	34,380	34,380	0%	364.38	186.22	-49%	8,935,974	4,617,617	-4,318,357
	Diesel Oil total	54,915	54,915	0%	624.73	388.24	-37%	23,082,189	16,835,117	-6,247,072	
	pre-Cars	3,933	3,933	0%	1034.87	737.35	-29%				

Adjustment details for 2018

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions			
		current	adjusted	difference	current	adjusted	difference	current	adjusted	difference	
		km [T]	km [T]	in [%]	in [g/T]	in [g/T]	in [%]	in [kg]	in [kg]	in [t]	
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	12,219	12,219	0%	637.58	648.11	-15%	7,780,965	6,608,721	-1,172,234
		Car 1	14,362	14,362	0%	374.34	341.68	-30%	5,371,161	3,488,643	-1,882,518
		Car 2	24,285	24,285	0%	221.97	111.06	-50%	5,360,977	2,688,163	-2,672,814
		Car 3	43,642	43,642	0%	89.16	76.96	-13%	3,897,781	3,358,617	-539,164
		Car 4	279,738	279,738	0%	55.98	52.30	-6%	15,683,498	14,578,755	-1,104,743
		Car 5	186,830	186,830	0%	19.38	52.30	-170%	3,238,282	6,725,666	-3,487,384
	Car 6	159,041	159,041	0%	6.00	52.30	-88%	4,190,422	6,718,256	-2,527,834	
	Gasoline total	680,027	680,027	0%	64.42	68.45	-6%	45,032,995	41,786,893	2,253,228	
	Diesel Oil	pre-Cars	1,643	1,643	0%	303.16	344.56	-13%	396,486	349,173	47,313
		Car 1	2,049	2,049	0%	294.17	322.65	-9%	862,432	735,166	127,277
		Car 2	10,784	10,784	0%	407.20	322.67	-25%	4,391,983	2,483,536	1,908,448
		Car 3	40,786	40,786	0%	612.49	180.15	-71%	24,932,029	7,333,241	17,598,788
		Car 4	130,534	130,534	0%	414.71	180.40	-56%	54,133,837	20,937,329	33,196,508
		Car 5	291,212	291,212	0%	416.25	180.40	-56%	104,585,786	40,293,731	64,292,055
	Car 6	228,685	228,685	0%	254.87	180.43	-29%	58,284,140	36,680,446	21,603,700	
	Diesel oil total	666,076	666,076	0%	375.66	183.38	-52%	247,596,063	188,768,684	58,827,379	
	PKs Total	1,346,103	1,346,103	0%	214.34	154.68	-28%	262,589,060	186,555,477	76,033,583	
1.A.3.b.i - Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	917	917	0%	664.33	648.56	-1%	596,889	582,862	14,027
		Car 1	189	189	0%	911.58	312.78	-66%	88,528	33,886	54,642
		Car 2	377	377	0%	303.64	224.45	-26%	114,682	84,133	30,549
		Car 3	511	511	0%	111.32	116.84	5%	57,282	60,739	-3,457
		Car 4	1,275	1,275	0%	52.02	54.36	4%	65,289	69,278	-3,989
		Car 5	1,483	1,483	0%	23.70	54.36	129%	35,160	80,626	-45,466
	Car 6	1,643	1,643	0%	19.59	54.36	182%	33,650	89,326	-55,676	
	Gasoline total	6,315	6,315	0%	154.22	160.11	-4%	999,199	1,011,136	-11,937	
	Diesel Oil	pre-Cars	1,872	1,872	0%	411.57	386.79	-6%	771,337	674,432	96,905
		Car 1	1,285	1,285	0%	389.84	276.25	-29%	483,129	372,286	110,843
		Car 2	2,942	2,942	0%	318.56	193.80	-39%	965,289	590,789	374,500
		Car 3	9,363	9,363	0%	159.10	150.74	-5%	5,609,152	4,411,299	1,197,853
		Car 4	33,232	33,232	0%	109.42	93.81	-13%	15,929,185	13,117,457	2,811,728
		Car 5	66,283	66,283	0%	432.92	93.81	-78%	28,094,880	6,217,860	21,877,020
	Car 6	39,482	39,482	0%	158.79	93.81	-41%	5,941,615	3,696,208	2,245,407	
	Diesel oil total	154,259	154,259	0%	384.71	182.69	-53%	69,344,525	55,880,316	13,464,210	
	LDVs Total	180,574	180,574	0%	375.86	184.94	-52%	69,344,525	66,637,449	2,707,076	
1.A.3.b.ii - Heavy Duty Vehicles (HDVs)	Diesel Oil	pre-Cars	547	547	0%	1076.16	1919.23	-43%	589,267	587,147	2,120
		Car 1	237	237	0%	732.67	132.67	-82%	176,368	4,808	171,560
		Car 2	2,270	2,270	0%	787.83	646.33	-18%	1,788,686	1,447,437	1,341,249
		Car 3	6,757	6,757	0%	638.80	409.32	-36%	4,262,734	3,183,492	1,079,242
		Car 4	3,043	3,043	0%	473.96	362.73	-24%	1,439,790	1,073,333	366,457
		Car 5	19,189	19,189	0%	362.42	186.37	-49%	6,663,265	3,075,016	3,588,249
	Car 6	20,670	20,670	0%	64.89	186.37	288%	1,176,026	3,682,314	-2,506,288	
	Diesel total	51,634	51,634	0%	309.75	283.53	-9%	19,935,246	13,887,186	6,048,060	
	Trucks & Lorries	pre-Cars	3,262	3,262	0%	1034.82	737.35	-29%	3,375,339	2,485,071	890,268
		Car 1	1,094	1,094	0%	747.82	488.39	-34%	918,052	512,378	405,674
		Car 2	5,548	5,548	0%	917.44	581.68	-36%	4,332,190	2,781,918	1,550,272
		Car 3	20,583	20,583	0%	629.54	563.68	-9%	12,967,751	7,277,279	5,690,472
		Car 4	15,912	15,912	0%	368.00	276.23	-25%	6,334,421	4,386,424	1,947,997
		Car 5	154,983	154,983	0%	250.40	154.68	-38%	45,984,153	24,283,389	21,700,764
	Car 6	381,799	381,799	0%	68.76	154.68	125%	26,251,482	69,665,888	-43,414,406	
	Trucks total	585,186	585,186	0%	515.18	172.19	-67%	180,173,337	180,190,869	-17,527	
	1.A.3.b.iii - Motorised Two-Wheelers (M2Ws)	Gasoline	pre-Cars	4,940	4,940	0%	128.95	188.61	-32%	622,656	783,451
Car 1			2,965	2,965	0%	128.94	177.79	-27%	374,114	527,294	-153,180
Car 2			3,221	3,221	0%	129.33	188.64	-32%	387,596	639,633	-252,037
Car 3			6,241	6,241	0%	49.24	188.64	281%	251,126	1,239,688	-988,562
Car 4			1,130	1,130	0%	38.41	188.64	491%	23,066	224,622	-201,556
Car 5			0	0	0%	0.00	0	0%	0	0	0
M2Ws total		18,497	18,497	0%	89.86	188.61	109%	1,688,588	3,454,347	-1,765,759	
1.A.3.b - Road Transport		Total	2,180,983	2,180,983	0%	215.85	133.49	-38%	479,758,296	291,129,652	178,628,644

Adjustment details for 2019

NFR Code	Fuel	Activity Data			Implied Emission Factor			NO _x Emissions			
		current	adjusted	difference	current	adjusted	difference	current	adjusted	difference	
		km [T]	km [T]	in [%]	in [g/T]	in [g/T]	in [%]	in [kg]	in [kg]	in [t]	
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	13,589	13,589	0%	638.58	648.11	-1%	8,664,621	7,382,688	1,281,933
		Car 1	12,427	12,427	0%	378.32	341.68	-30%	4,781,480	3,083,383	1,698,096
		Car 2	20,086	20,086	0%	225.58	111.06	-50%	4,531,070	1,868,018	2,662,852
		Car 3	39,216	39,216	0%	82.22	76.12	-8%	2,977,840	2,829,186	148,654
		Car 4	295,220	295,220	0%	57.04	52.29	-1%	14,588,285	13,989,621	598,664
		Car 5	180,537	180,537	0%	19.77	52.29	170%	3,173,720	6,584,356	-3,410,636
	Car 6	266,636	266,636	0%	25.63	52.29	180%	5,295,099	11,010,782	-5,715,683	
	Gasoline total	766,031	766,031	0%	62.36	68.45	-10%	43,961,591	40,238,025	3,723,566	
	Diesel Oil	pre-Cars	1,756	1,756	0%	333.78	373.16	-9%	613,188	524,923	88,265
		Car 1	2,046	2,046	0%	294.88	322.65	-9%	784,913	687,386	97,527
		Car 2	8,891	8,891	0%	407.59	322.67	-24%	3,620,286	2,037,480	1,582,806
		Car 3	33,079	33,079	0%	615.11	180.42	-71%	20,370,125	5,967,483	14,402,642
		Car 4	111,335	111,335	0%	419.17	182.44	-56%	45,668,685	18,085,228	27,583,457
		Car 5	231,784	231,784	0%	418.37	182.44	-56%	95,117,643	37,650,987	57,466,656
	Car 6	273,511	273,511	0%	227.30	182.44	-20%	62,189,230	44,429,184	17,760,046	
	Diesel oil total	663,841	663,841	0%	345.81	185.67	-47%	229,566,089	189,582,982	139,983,106	
	PKs Total	1,368,532	1,368,532	0%	309.83	195.32	-36%	273,488,099	157,821,007	115,667,092	
1.A.3.b.i - Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	926	926	0%	644.89	648.56	-1%	681,419	681,962	-543
		Car 1	97	97	0%	915.20	312.78	-66%	88,953	30,386	58,567
		Car 2	376	376	0%	304.63	224.45	-26%	96,158	70,848	25,310
		Car 3	447	447	0%	112.68	121.47	5%	50,365	54,283	-3,918
		Car 4	1,126	1,126	0%	53.06	55.26	4%	59,652	62,199	-2,547
		Car 5	1,361	1,361	0%	25.34	55.26	119%	34,240	74,680	-40,440
	Car 6	2,420	2,420	0%	18.75	55.26	193%	45,383	133,753	-88,370	
	Gasoline total	6,683	6,683	0%	144.88	153.25	-6%	974,279	1,004,156	-29,877	
	Diesel Oil	pre-Cars	1,784	1,784	0%	418.36	386.79	-8%	725,111	641,376	83,735
		Car 1	1,079	1,079	0%	389.52	276.25	-29%	420,285	332,256	88,029
		Car 2	2,334	2,334	0%	318.36	193.79	-39%	737,682	454,636	283,046
		Car 3	7,649	7,649	0%	601.11	150.78	-75%	4,587,943	1,152,711	3,435,232
		Car 4	28,711	28,711	0%	512.20	94.67	-82%	14,700,380	2,715,154	11,985,226
		Car 5	58,716	58,716	0%	434.30	94.67	-78%	25,499,580	5,652,428	19,847,152
	Car 6	59,931	59,931	0%	145.18	94.67	-35%	8,614,086	6,722,892	1,891,194	
	Diesel oil total	159,183	159,183	0%	347.44	181.99	-48%	55,383,535	36,221,446	19,162,089	
	LDVs Total	185,866	185,866	0%	339.31	183.97	-46%	66,279,544	11,245,596	55,033,948	
1.A.3.b.ii - Motorised Two-Wheelers (M2Ws)	Gasoline	pre-Cars	489	489	0%	1086.20	1919.23	-43%	589,267	476,258	113,009
		Car 1	147	147	0%	736.37	132.67	-82%	180,212	110,933	69,279
		Car 2	1,611	1,							

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Adjustment 2014 (accepted) ^{7), 8)}	-105.6	-101.3	-95.7	-91.7						
Adjustment 2015 (accepted) ^{9), 10)}	-100.3	-95.5	-89.9	-85.1						
Adjustment 2016 (accepted) ^{11), 12)}	-151.3	-146.9	-145.1	-142.5	-128.1					
Adjustment 2017 (accepted) ¹³⁾	-151.3	-146.8	-145.0	-142.4	-127.2	-100.9				
Adjustment 2018 (accepted) ^{14), 15)}	-172.3	-174.5	-177.4	-180.4	-171.5	-148.9	-123.2			
Adjustment 2019 (accepted) ^{16), 17)}	-172.3	-174.5	-177.4	-180.3	-171.4	-148.8	-123.3	-93.7		
Adjustment 2020 (accepted) ¹⁸⁾	-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". ¹⁹⁾

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 ²⁰⁾ 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, taking into account results from ongoing measurement campaigns especially for EURO 6 vehicles. Hence, the 2021 adjustment proposal differs onyl slightly from the (accepted) proposal provided with submission 2020.

¹⁾ IIASA, 1999: Amann, M.; Bertok, I.; Cofala, J.; Gyarmas, F.; Heyes, Chr.; Klimont, Zb.; Syri, S.; Schöpp, W.: Further analysis of scenario results obtained with the RAINS model - Interim Report to the Ministère de L'Aménagement du Territoire et de l'Environnement Direction de la Prévention des Pollutions et des Risques 20, avenue de Ségur75302 Paris 07 SP, April 1999 - URL: <https://iiasa.ac.at/web/home/research/researchPrograms/air/policy/france3b.pdf>

²⁾ EB, 2012a: CLRTAP EB Decision 2012/3, ECE/EB.AIR/111/Add.1: Adjustments under the Gothenburg Protocol to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them URL: http://www.unece.org/fileadmin/DAM/env/documents/2013/air/ECE_EB.AIR_111_Add.1_ENG_DECISION_3.pdf

³⁾ EB, 2012c: CLRTAP EB Decision 2012/12: Guidance for adjustments under the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them URL: http://www.unece.org/fileadmin/DAM/env/documents/2012/EB/Decision_2012_12.pdf

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