

# Adjustment DE-A regarding NO<sub>x</sub> 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<sub>x</sub>, (IIASA, 1999) <sup>1)</sup>. The over-all 2010 national emission ceiling (NEC) for NO<sub>x</sub>, was set to 1,081 kt. When negotiating the EU NEC Directive two years later, Germany agreed to reduce its NO<sub>x</sub>, emissions further, resulting in a NEC of 1,051 kt.

In its 2016 NEC emissions reporting, Germany provided a national total for NO<sub>x</sub>, 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, 2012a & c) <sup>2), 3)</sup> was agreed. This procedure is applicable also for existing NECs (EB, 2012b) <sup>4)</sup>.

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<sub>x</sub>, 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) <sup>5)</sup>. 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<sub>x</sub>, emissions for four selected countries (Germany, France, Netherlands and Belgium) and found higher NO<sub>x</sub>, 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<sub>x</sub>, 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<sub>x</sub>. However, as changes in AD are no valid adjustment reason, the latter value is for information only.

This was mainly due to: \* NO<sub>x</sub>, 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<sub>x</sub>, 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<sub>x</sub>, 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 EM<sup>1</sup>**

<sup>1</sup> "artificial" current emissions = virtual current emissions assuming no changes in emission factors

$$EM_{\text{adjustment}} = AD_{\text{current}} * EF_{\text{current}} - AD_{\text{current}} * EF_{\text{original}} = AD_{\text{current}} * (EF_{\text{current}} - EF_{\text{original}}) = EM_{\text{current}} - EM_{\text{current-artificial}}$$

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

TREMODO, 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 (2020).

Unfortunately, the oldest TREMOD version available for such comparison is TREMOD 3.1 from 2002<sup>6)</sup>, including the following set of NO<sub>x</sub>, 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<sub>x</sub>, 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<sub>x</sub>, 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 6.02 (Knörr et al., 2019a)<sup>7)</sup>.

### 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<sub>x</sub>, 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
<b>proposed adjustment</b>										

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<sub>x</sub>, 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

NER Code	Fuel	Year	Activity Data			Implied Emission Factor			NO <sub>x</sub> 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	94.99	-13%	77.644.842	67.959.906	9.683.935	-13%
1.A.3.b.i	diesel oil		529.390	529.390	0%	429.45	160.51	-63%	227.341.056	84.370.461	142.970.635	-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	diesel oil		46.844	46.844	0%	623.00	482.55	-23%	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	-46%
1.A.3.b.i	gasoline		794.688	794.688	0%	92.09	81.61	-11%	73.185.851	64.351.951	8.333.900	-11%
1.A.3.b.i	diesel oil		553.564	553.564	0%	434.12	159.22	-63%	248.313.791	88.138.959	160.174.832	-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	diesel oil		47.365	47.365	0%	592.65	448.99	-24%	28.071.221	21.286.323	6.884.898	-24%
1.A.3.b.iii	diesel oil		563.891	563.891	0%	419.38	244.97	-40%	231.410.271	138.136.342	93.273.929	-40%
1.A.3.b.iv	gasoline		19.289	19.289	0%	119.79	171.60	54%	2.137.602	3.299.162	-1.162.160	54%
1.A.3.b TOTAL		2011	2.100.883	2.100.883	0%			0%	632.365.736	331.625.655	300.740.081	-48%
1.A.3.b.i	gasoline		750.957	750.957	0%	85.73	78.00	-9%	64.379.994	58.577.229	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%	55.106.382	13.741.354	41.365.028	-75%
1.A.3.b.iii	diesel oil		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		589.585	589.585	0%	381.33	224.00	-41%	224.829.180	132.064.753	92.764.428	-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	300.420.094	-49%
1.A.3.b.i	gasoline		749.114	749.114	0%	80.35	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%	257.533.728	93.499.010	164.034.718	-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		116.777	116.777	0%	489.60	114.93	-76%	57.003.533	13.690.488	43.333.045	-76%
1.A.3.b.iii	diesel oil		81.716	81.716	0%	509.54	369.96	-29%	26.350.969	18.420.843	7.930.126	-29%
1.A.3.b.iii	diesel oil		600.139	600.139	0%	353.06	287.93	-19%	211.887.531	124.788.459	87.099.072	-41%
1.A.3.b.iv	gasoline		18.229	18.229	0%	194.34	175.38	-9%	1.902.668	3.197.038	-1.294.361	68%
1.A.3.b TOTAL		2013	2.132.683	2.132.683	0%			0%	616.078.063	316.854.371	300.224.692	-50%
1.A.3.b.i	gasoline		752.526	752.526	0%	75.03	73.09	-3%	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	99.613.892	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%	61.146.575	14.267.237	46.879.338	-77%
1.A.3.b.iii	diesel oil		45.143	45.143	0%	468.37	339.99	-27%	23.017.116	16.708.234	6.308.881	-27%
1.A.3.b.iii	diesel oil		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		18.673	18.673	0%	100.59	179.24	78%	1.878.294	3.346.794	-1.468.499	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		135.396	135.396	0%	469.35	187.96	-77%	63.505.443	14.607.490	48.897.953	-77%
1.A.3.b.iii	diesel oil		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%	157.189.676	116.529.703	40.659.973	-30%
1.A.3.b.iv	gasoline		18.459	18.459	0%	99.32	180.65	82%	1.833.362	3.334.472	-1.501.090	82%
1.A.3.b TOTAL		2015	2.161.576	2.161.576	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%	50.736.967	50.535.049	201.918	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%	189.27	171.06	-9%	1.068.292	1.013.678	54.614	-5%
1.A.3.b.ii	diesel oil		144.068	144.068	0%	458.12	185.62	-77%	65.712.732	15.216.007	50.496.726	-77%
1.A.3.b.iii	diesel oil		54.157	54.157	0%	424.73	388.24	-9%	23.002.109	16.893.117	6.308.992	-27%
1.A.3.b.iii	diesel oil		594.013	594.013	0%	226.31	180.97	-20%	134.431.899	107.496.262	26.935.637	-20%
1.A.3.b.iv	gasoline		18.785	18.785	0%	96.14	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%	553.799.556	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	-1.608.640	3%
1.A.3.b.i	diesel oil		696.592	696.592	0%	399.65	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		153.294	153.294	0%	424.66	183.89	-78%	66.093.930	15.925.216	50.168.714	-76%
1.A.3.b.iii	diesel oil		53.382	53.382	0%	378.80	286.71	-23%	19.793.501	15.304.828	4.488.673	-23%
1.A.3.b.iii	diesel oil		596.263	596.263	0%	195.02	175.92	-9%	116.671.141	105.248.508	11.422.633	-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	304.469.906	221.079.424	-42%
1.A.3.b.i	gasoline		699.027	699.027	0%	64.42	68.36	6%	45.032.596	47.786.817	-2.753.820	6%
1.A.3.b.i	diesel oil		666.074	666.074	0%	371.66	163.30	-56%	247.695.063	108.768.604	138.926.459	-56%
1.A.3.b.ii	gasoline		6.315	6.315	0%	158.22	168.11	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	diesel oil		51.634	51.634	0%	399.75	263.53	-35%	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%	188.173.337	188.710.869	-537.532	1%
1.A.3.b.iv	gasoline		18.497	18.497	0%	89.66	184.61	106%	1.658.568	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	-38%
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		683.841	683.841	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	1.024.160	-47.931	5%
1.A.3.b.ii	diesel oil		159.183	159.183	0%	347.42	181.90	-71%	55.303.335	16.221.445	39.081.890	-71%
1.A.3.b.iii	diesel oil		52.939	52.939	0%	274.41	247.81	-9%	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	100.809.376	-9.428.676	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	2.202.000	2.202.000	0%			0%	437.268.744	292.497.497	144.771.248	-33%

Adjustment details for 2020												
NFR Code	Fuel	Activity Data			Implied Emission Factor			NO <sub>x</sub> 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 [kg]	
1.A.3.a.i. Passenger Cars	Gasoline	pre-Cars	13.685	13.685	0%	584.75	514.25	-12%	7.955.060	6.986.917	-958.143	-12%
		Car 1	36.541	36.541	0%	338.50	297.71	-12%	25.915.925	20.189.262	-3.716.663	-14%
		Car 2	96.425	96.425	0%	172.95	135.63	-22%	16.580.020	13.020.026	-3.559.995	-22%
		Car 3	133.139	133.139	0%	58.51	70.18	20%	7.790.384	9.343.433	1.553.049	20%
		Car 4	444.981	444.981	0%	42.27	42.19	0%	18.911.389	18.773.529	-137.859	0%
		Car 5	31.234	31.234	0%	18.61	42.19	127%	581.142	1.317.737	736.595	127%
		Car 6	0	0	0%	25.08	42.19	67%	2	3	1	67%
		Gasoline total	795.057	795.057	0%	92.55	84.99	-9%	37.644.642	31.656.586	-5.988.055	-16%
	Diesel Oil	pre-Cars	1.515	1.515	0%	312.13	264.56	-15%	383.760	327.256	-56.505	-15%
		Car 1	10.338	10.338	0%	294.42	245.17	-17%	3.044.428	2.741.387	-303.041	-17%
		Car 2	50.088	50.088	0%	406.90	279.19	-31%	20.372.795	10.974.210	-9.398.584	-46%
		Car 3	134.025	134.025	0%	542.54	170.54	-69%	72.645.173	23.929.276	-48.715.897	-67%
		Car 4	279.154	279.154	0%	304.37	140.58	-53%	187.299.180	39.243.811	-148.055.369	-80%
		Car 5	53.547	53.547	0%	434.70	140.58	-68%	23.276.735	7.527.796	-15.748.939	-68%
		Car 6	334	334	0%	257.62	140.58	-45%	85.044	46.953	-38.091	-45%
		Diesel oil total	529.380	529.380	0%	429.45	160.55	-63%	227.347.096	84.970.461	-142.376.635	-63%
		Flx Total	1,325,337	1,325,337	0%	238.12	155.14	-35%	364,985.938	152,627.367	-212,358.570	-58%
1.A.3.b.i. Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	1.249	1.249	0%	627.99	545.95	-13%	183.760	157.255	-26.505	-14%
		Car 1	36.541	36.541	0%	338.50	297.71	-12%	25.915.925	20.189.262	-3.716.663	-14%
		Car 2	96.425	96.425	0%	172.95	135.63	-22%	16.580.020	13.020.026	-3.559.995	-22%
		Car 3	133.139	133.139	0%	58.51	70.18	20%	7.790.384	9.343.433	1.553.049	20%
		Car 4	2.420	2.420	0%	36.32	44.90	24%	87.887	185.679	97.792	24%
		Car 5	49	49	0%	15.34	44.90	187%	758	2.239	1.480	187%
		Car 6	0	0	0%	0	0	0%	0	0	0	0%
	Gasoline total	6.325	6.325	0%	255.87	254.75	-1%	1.619.832	1.356.338	-263.494	-16%	
	Diesel Oil	pre-Cars	4.876	4.876	0%	425.99	389.79	-9%	2.077.142	1.495.953	-581.189	-28%
		Car 1	5.989	5.989	0%	355.59	275.46	-23%	2.369.098	1.289.030	-1.080.069	-46%
		Car 2	13.126	13.126	0%	336.76	193.18	-42%	4.420.380	2.534.731	-1.885.649	-43%
		Car 3	33.249	33.249	0%	571.01	150.58	-74%	17.053.085	5.086.190	-11.966.895	-72%
		Car 4	54.581	54.581	0%	499.42	86.49	-83%	26.921.023	4.940.722	-21.979.114	-81%
		Car 5	1.629	1.629	0%	427.50	86.49	-79%	696.296	144.434	-551.772	-79%
		Car 6	0	0	0%	91.73	86.49	-5%	7	4	-3	-42%
		Diesel oil total	113.450	113.450	0%	476.34	134.96	-72%	54.943.513	15.371.584	-39.571.929	-72%
LDVs Total		119.775	119.775	0%	464.70	139.18	-70%	55.658.966	16.649.953	-39.009.013	-70%	
1.A.3.b.ii. Heavy Duty Vehicles (HDVs)	pre-Cars	3.382	3.382	0%	909.25	1029.78	13%	3.674.067	3.452.644	-221.423	-6%	
	Car 1	2.826	2.826	0%	749.41	734.14	-2%	2.117.071	2.125.595	7.523	0%	
	Car 2	10.152	10.152	0%	801.96	640.47	-20%	8.140.139	6.532.210	-1.607.929	-20%	
	Car 3	15.080	15.080	0%	528.28	417.23	-21%	10.125.182	7.265.299	-2.859.883	-23%	
	Car 4	5.461	5.461	0%	448.63	351.85	-21%	2.450.076	1.901.527	-548.549	-23%	
	Car 5	10.325	10.325	0%	337.28	182.33	-46%	3.482.472	1.982.544	-1.500.927	-46%	
	Car 6	0	0	0%	0	0	0%	0	0	0	0%	
Buses Total	48.044	48.044	0%	623.90	482.55	-23%	29.931.266	25.183.732	-4.747.534	-23%		
1.A.3.b.iii. Heavy Duty Vehicles (HDVs) & Lorries	pre-Cars	10.185	10.185	0%	9049.16	787.37	-26%	10.510.623	7.154.138	-3.356.485	-26%	
	Car 1	5.677	5.677	0%	758.59	575.55	-24%	2.461.383	3.267.691	805.302	23%	
	Car 2	36.558	36.558	0%	817.62	544.79	-33%	31.525.526	20.254.619	-11.269.907	-36%	
	Car 3	183.023	183.023	0%	528.28	274.48	-48%	91.125.182	19.515.271	-71.609.910	-48%	
	Car 4	69.635	69.635	0%	399.94	290.02	-27%	37.183.067	20.166.635	-17.017.230	-46%	
	Car 5	269.934	269.934	0%	278.62	151.85	-45%	79.540.643	43.195.887	-36.344.756	-45%	
	Car 6	0	0	0%	0	0	0%	0	0	0	0%	
Trucks Total	566.741	566.741	0%	446.67	271.83	-39%	253.148.243	134.096.160	-119.052.083	-39%		
1.A.3.b.iv. Motorised Two-Wheelers (MTWs)	pre-Cars	7.973	7.973	0%	122.90	149.16	22%	972.721	1.189.385	216.662	22%	
	Car 1	5.231	5.231	0%	123.77	145.74	14%	647.479	887.029	239.550	34%	
	Car 2	3.587	3.587	0%	141.95	194.21	36%	585.352	696.681	110.329	30%	
	Car 3	2.950	2.950	0%	38.11	194.21	387%	116.198	547.032	430.834	387%	
	Car 4	0	0	0%	0	0	0%	0	0	0	0%	
	Car 5	0	0	0%	0	0	0%	0	0	0	0%	
	Car 6	0	0	0%	0	0	0%	0	0	0	0%	
MTWs Total	19.712	19.712	0%	113.68	148.43	30%	2.240.749	3.326.034	1.075.285	48%		
1.A.3.b. Road Transport	Total	2,079,698	2,079,698	0%	218.62	168.23	-46%	645,955.152	349,851.296	-296,103.856	-46%	



Adjustment details for 2023												
NFR Code	Fuel	Activity Data			Implied Emission Factor			NO <sub>x</sub> 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-Euro	11,561	11,561	0%	607.72	635.39	-2%	7,026,041	6,189,785	-836,256	-12%
		Euro 1	47,487	47,487	0%	348.56	341.62	-2%	16,571,746	11,426,129	-5,145,617	-31%
		Euro 2	72,781	72,781	0%	194.27	172.82	-25%	13,487,749	10,039,380	-3,372,369	-25%
		Euro 3	189,443	189,443	0%	63.89	72.62	14%	6,927,963	7,875,172	947,209	14%
		Euro 4	489,541	489,541	0%	45.39	45.13	-1%	18,541,881	18,436,736	-105,145	-1%
		Euro 5	181,961	181,961	0%	18.61	45.13	142%	1,897,355	4,681,311	2,783,956	142%
	Euro 6	282	282	0%	25.06	45.13	74%	7,339	12,736	5,399	74%	
	Gasoline total	790,957	790,957	0%	85.73	78.89	-8%	64,379,964	58,577,229	-5,802,735	-9%	
	Diesel Oil	pre-Euro	1,487	1,487	0%	311.98	284.56	-9%	463,963	383,872	-80,091	-17%
		Euro 1	6,660	6,660	0%	297.79	266.44	-11%	1,980,364	1,771,787	-208,577	-11%
		Euro 2	33,967	33,967	0%	406.82	279.27	-32%	13,987,432	7,445,646	-6,541,787	-48%
		Euro 3	183,539	183,539	0%	564.82	176.63	-69%	58,399,037	18,434,837	-39,964,200	-69%
		Euro 4	234,943	234,943	0%	398.41	146.46	-63%	91,724,195	34,488,997	-57,235,198	-63%
		Euro 5	173,112	173,112	0%	434.89	146.46	-66%	75,284,364	25,353,375	-49,930,989	-66%
	Euro 6	1,557	1,557	0%	239.84	146.46	-44%	484,664	220,086	-264,578	-54%	
	Diesel oil total	555,245	555,245	0%	415.96	158.66	-62%	242,962,962	88,096,639	-154,866,323	-64%	
	FCs Total	1,346,202	1,346,202	0%	234.61	115.29	-51%	386,442,896	146,673,867	-239,769,029	-62%	
	Gasoline	pre-Euro	962	962	0%	632.39	645.95	2%	967,779	921,160	-46,619	-5%
		Euro 1	232	232	0%	803.24	393.22	-51%	199,985	70,295	-129,690	-61%
		Euro 2	989	989	0%	271.16	195.74	-28%	269,134	133,538	-135,596	-50%
		Euro 3	835	835	0%	89.38	98.33	10%	14,623	82,092	7,469	10%
		Euro 4	2,030	2,030	0%	38.49	47.58	24%	78,155	96,691	18,536	24%
		Euro 5	610	610	0%	16.36	47.58	182%	9,941	29,011	19,069	182%
		Euro 6	0	0	0%	16.37	47.58	210%	2	6	4	210%
		Gasoline total	5,657	5,657	0%	218.93	193.15	-12%	1,238,520	1,092,662	-145,858	-12%
Diesel Oil		pre-Euro	3,281	3,281	0%	424.46	386.79	-9%	1,368,754	982,093	-376,661	-28%
		Euro 1	3,666	3,666	0%	399.34	276.24	-30%	1,445,980	787,634	-658,346	-46%
	Euro 2	8,479	8,479	0%	336.40	133.39	-49%	2,852,325	1,639,772	-1,212,553	-43%	
	Euro 3	23,785	23,785	0%	558.53	150.44	-73%	13,050,281	3,566,082	-9,484,199	-73%	
	Euro 4	59,485	59,485	0%	494.22	89.85	-82%	29,369,070	5,337,395	-24,031,675	-82%	
	Euro 5	15,964	15,964	0%	442.70	89.85	-80%	7,040,451	1,420,906	-5,619,545	-80%	
	Euro 6	1	1	0%	151.94	89.85	-41%	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%	
LDVs Total	129,008	129,008	0%	409.51	123.61	-74%	56,344,963	14,834,656	-41,510,307	-74%		
1.A.3.b.ii. Heavy Duty Vehicles (HDVs)	Diesel Oil	pre-Euro	1,326	1,326	0%	1093.46	1919.46	4%	1,410,640	1,352,283	-58,357	-4%
		Euro 1	1,245	1,245	0%	727.34	731.15	1%	987,476	1,017,184	29,708	3%
		Euro 2	7,788	7,788	0%	703.46	643.34	-9%	6,085,091	4,997,478	-1,087,613	-18%
		Euro 3	14,483	14,483	0%	629.94	437.61	-31%	9,073,197	6,689,744	-2,383,453	-27%
		Euro 4	5,331	5,331	0%	468.10	361.86	-22%	2,642,179	1,677,766	-964,413	-37%
		Euro 5	20,752	20,752	0%	347.84	182.99	-47%	7,219,563	3,787,467	-3,432,096	-48%
		Euro 6	73	73	0%	64.52	182.99	236%	3,961	13,296	9,334	236%
		Diesel Total	50,962	50,962	0%	533.22	384.33	-28%	27,141,913	19,945,288	-7,196,625	-28%
	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. Motorized Two-Wheelers (MOWs)	Gasoline	pre-Euro	6,180	6,180	0%	122.76	151.03	23%	822,530	1,011,520	188,991
Euro 1			4,386	4,386	0%	134.61	171.39	28%	536,615	738,050	201,435	38%
Euro 2			3,267	3,267	0%	136.22	184.56	35%	445,087	636,853	191,766	43%
Euro 3			3,984	3,984	0%	38.66	184.56	382%	18,386	778,616	760,230	382%
Euro 4			0	0	0%	0	0	0%	0	0	0	0%
Euro 5			0	0	0%	0	0	0%	0	0	0	0%
MOWs total			18,268	18,268	0%	107.43	173.28	61%	1,982,546	3,165,439	1,182,893	61%
1.A.3.b. Road Transport			Total	2,084,964	2,084,964	0%	295.79	151.71	-49%	616,721,438	396,381,343	-220,340,094

Adjustment details for 2023												
NFR Code	Fuel	Activity Data			Implied Emission Factor			NO <sub>x</sub> 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-Euro	11,680	11,680	0%	618.27	649.35	-5%	7,011,541	6,967,452	-4,889	-0%
		Euro 1	37,743	37,743	0%	353.78	341.68	-3%	13,362,986	9,129,495	-4,233,491	-32%
		Euro 2	62,680	62,680	0%	188.93	139.33	-27%	11,889,922	8,722,244	-3,167,678	-27%
		Euro 3	97,792	97,792	0%	66.38	73.19	10%	6,481,618	7,156,920	675,303	10%
		Euro 4	397,911	397,911	0%	47.22	46.52	-1%	18,790,345	18,589,937	-200,407	-1%
		Euro 5	138,063	138,063	0%	18.60	46.52	150%	2,583,150	6,439,691	3,856,541	150%
		Euro 6	2,714	2,714	0%	25.99	46.52	79%	70,526	126,237	55,711	79%
		Gasoline total	748,114	748,114	0%	88.35	74.85	-16%	69,090,687	56,671,737	-12,418,950	-18%
	Diesel Oil	pre-Euro	1,389	1,389	0%	312.32	284.56	-9%	463,963	386,139	-77,824	-17%
		Euro 1	6,605	6,605	0%	298.42	246.79	-17%	1,970,472	1,580,688	-389,784	-20%
		Euro 2	29,437	29,437	0%	406.84	279.91	-32%	13,987,432	8,925,561	-5,061,871	-36%
		Euro 3	182,795	182,795	0%	574.33	176.67	-69%	58,389,037	18,434,837	-39,954,200	-68%
		Euro 4	222,583	222,583	0%	393.55	149.27	-62%	87,589,471	33,225,566	-54,363,905	-62%
		Euro 5	233,786	233,786	0%	435.42	149.27	-66%	101,787,275	34,884,788	-66,902,487	-66%
		Euro 6	4,536	4,536	0%	219.53	149.27	-32%	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	1,337,245	1,337,245	0%	237.49	111.77	-53%	317,723,735	140,571,356	-177,152,379	-56%
	Gasoline	pre-Euro	981	981	0%	633.81	645.95	2%	968,320	921,160	-47,160	-5%
		Euro 1	194	194	0%	803.50	393.22	-51%	187,281	59,328	-127,953	-68%
		Euro 2	836	836	0%	274.42	291.18	11%	229,520	188,285	-41,235	-18%
		Euro 3	784	784	0%	52.66	191.79	10%	72,691	79,780	7,089	10%
		Euro 4	1,889	1,889	0%	43.70	48.89	13%	77,284	82,833	5,549	7%
		Euro 5	965	965	0%	16.37	48.89	183%	15,187	47,268	32,081	183%
		Euro 6	1	1	0%	17.66	48.89	170%	26	72	46	170%
		Gasoline total	5,578	5,578	0%	262.86	184.67	-30%	1,137,299	1,092,662	-44,637	-4%
	Diesel Oil	pre-Euro	2,744	2,744	0%	424.37	386.79	-9%	1,168,757	982,093	-186,664	-16%
		Euro 1	1,054	1,054	0%	727.68	731.15	1%	987,476	1,017,184	29,708	3%
		Euro 2	6,982	6,982	0%	336.92	155.35	-54%	2,348,147	1,350,014	-998,133	-42%
Light Duty Vehicles (LDV)	Euro 3	20,424	20,424	0%	558.32	150.37	-73%	11,437,989	3,620,845	-7,817,144	-68%	
	Euro 4	55,087	55,087	0%	407.72	90.45	-42%	27,776,440	5,040,454	-22,735,986	-79%	
	Euro 5	29,024	29,024	0%	441.97	90.45	-40%	13,181,325	2,687,954	-10,493,371	-80%	
	Euro 6	41	41	0%	161.28	90.45	-44%	6,168	2,688	-3,479	-56%	
	Diesel oil total	118,777	118,777	0%	488.66	154.83	-68%	57,083,533	13,656,488	-43,427,045	-76%	
	LDVs Total	124,934	124,934	0%	488.14	156.03	-69%	58,214,142	14,677,215	-43,537,927	-78%	
	pre-Euro	1,172	1,172	0%	1098.69	1019.23	-7%	1,249,028	1,134,143	-114,885	-9%	
	Euro 1	1,054	1,054	0%	727.68	731.15	1%	987,476	1,017,184	29,708	3%	
1.A.3.a.ii. Heavy Duty Vehicles (HDV)	Euro II	6,984	6,984	0%	764.97	645.43	-16%	3,324,968	4,379,371	1,054,403	32%	
	Euro III	13,187	13,187	0%	638.43	473.65	-27%	6,262,880	5,998,226	-2,654,757	-42%	
	Euro IV	4,946	4,946	0%	460.55	351.71	-24%	2,278,061	1,739,736	-538,324	-24%	
	Euro V	26,096	26,096	0%	668.98	183.48	-40%	8,435,583	4,240,743	-4,194,761	-50%	
	Euro VI	537	537	0%	44.76	183.48	310%	24,047	86,672	74,625	310%	
	Buses Total	31,716	31,716	0%	595.94	360.06	-39%	25,369,989	16,620,843	-7,738,126	-29%	
	pre-Euro	5,983	5,983	0%	1030.72	737.35	-29%	6,072,170	4,322,888	-1,748,303	-29%	
	Euro I	2,944	2,944	0%	748.27	583.27	-24%	2,176,946	1,650,980	-525,977	-24%	
1.A.3.a.iii. Heavy Duty Vehicle: Trucks & Lorries	Euro II	16,885	16,885	0%	818.17	510.45	-37%	10,080,881	6,948,975	-3,131,906	-31%	
	Euro III	4,574	4,574	0%	633.52	487.73	-24%	47,587,448	27,881,577	-19,705,871	-42%	
	Euro IV	42,781	42,781	0%	356.96	287.27	-27%	16,936,867	12,289,770	-4,647,097	-27%	
	Euro V	436,980	436,980	0%	261.70	152.65	-41%	123,181,324	66,796,436	-56,384,887	-46%	
	Euro VI	18,020	18,020	0%	913.87	183.48	-20%	913,082	2,750,630	1,837,548	201%	
	Trucks Total	680,139	680,139	0%	353.96	287.33	-21%	218,587,531	124,188,469	-94,399,062	-43%	
	pre-Euro	6,352	6,352	0%	123.97	151.79	23%	781,736	964,170	182,433	23%	
	Euro I	4,013	4,013	0%	152.07	173.15	10%	582,073	634,880	52,807	9%	
1.A.3.b.iv. Motorised Two-Wheelers (MOW)	Euro 2	3,362	3,362	0%	132.24	158.58	40%	436,688	648,894	209,136	48%	
	Euro 3	4,562	4,562	0%	39.81	158.58	281%	181,610	882,175	716,565	281%	
	Euro 4	0	0	0%	0	0	0%	0	0	0	0%	
	Euro 5	0	0	0%	0	0	0%	0	0	0	0%	
	MOWs Total	18,229	18,229	0%	104.34	175.38	68%	1,962,088	3,197,038	1,234,951	68%	
	1.A.3.b. Road Transport	2,132,083	2,132,083	0%	268.88	186.27	-30%	616,073,963	310,854,371	-305,219,592	-50%	



Adjustment details for 2026												
NFR Code	Fuel	Activity Data			Implied Emission Factor			NO <sub>x</sub> Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	difference	
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [g]	in [g]	in [g]	in [g]	
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	15 782	15 782	0%	636.75	648.11	-14%	7 670 916	6 410 967	-1 657 867	-14%
		Car 1	20 270	20 270	0%	372.25	241.68	-35%	7 545 483	4 086 888	-2 648 596	-35%
		Car 2	36 062	36 062	0%	212.73	143.11	-33%	7 671 581	5 180 897	-2 510 683	-33%
		Car 3	83 039	83 039	0%	76.17	75.50	-1%	4 881 482	4 759 259	-42 233	-1%
		Car 4	334 413	334 413	0%	53.74	50.17	-7%	17 363 364	16 777 445	-1 192 488	-7%
		Car 5	183 374	183 374	0%	19.09	50.17	163%	3 580 745	9 189 834	5 609 089	163%
		Car 6	65 332	65 332	0%	25.67	50.17	89%	1 768 917	3 327 855	1 558 938	89%
		Gasoline total	715 272	715 272	0%	78.93	70.65	-9%	58 736 267	50 535 049	-8 201 218	-9%
	Diesel Oil	pre-Cars	1 380	1 380	0%	368.76	254.66	-31%	386 262	339 173	-46 089	-14%
		Car 1	3 749	3 749	0%	298.36	269.66	-9%	1 122 449	1 011 626	-111 425	-10%
		Car 2	16 584	16 584	0%	407.19	221.43	-46%	6 720 132	3 663 964	-3 056 168	-46%
		Car 3	81 398	81 398	0%	802.50	179.24	-78%	36 981 999	11 085 409	-25 896 590	-70%
		Car 4	175 040	175 040	0%	405.76	156.24	-61%	71 362 220	27 474 086	-43 878 214	-61%
		Car 5	299 054	299 054	0%	433.34	156.24	-64%	130 032 044	46 019 229	-83 212 815	-64%
		Car 6	116 034	116 034	0%	268.75	156.24	-41%	30 427 555	10 232 785	-19 194 770	-60%
		Diesel oil total	625 119	625 119	0%	418.36	160.76	-61%	277 947 660	188 535 230	-89 406 430	-61%
		Pkx Total	1 386 391	1 386 391	0%	235.75	154.41	-35%	62 778 627	159 070 289	-146 291 662	-59%
	Gasoline	pre-Cars	910	910	0%	602.79	645.95	-7%	593 186	547 543	-45 643	-8%
		Car 1	136	136	0%	908.31	312.78	-65%	122 126	42 425	-79 708	-66%
		Car 2	540	540	0%	308.39	217.84	-29%	162 311	117 737	-44 574	-27%
		Car 3	650	650	0%	108.43	111.57	3%	70 432	72 731	2 299	3%
		Car 4	1 684	1 684	0%	43.06	52.36	7%	78 714	84 003	5 289	7%
		Car 5	1 724	1 724	0%	19.82	52.36	164%	34 157	80 258	46 108	164%
		Car 6	363	363	0%	19.85	52.36	181%	6 764	18 992	12 228	181%
		Gasoline total	5 506	5 506	0%	588.27	171.66	-7%	1 068 292	1 013 678	-54 614	-5%
	Diesel Oil	pre-Cars	2 189	2 189	0%	414.81	386.73	-7%	899 549	885 433	-14 116	-2%
		Car 1	1 780	1 780	0%	391.89	276.25	-29%	780 189	585 371	-194 798	-24%
		Car 2	4 223	4 223	0%	323.43	153.31	-53%	1 365 594	676 452	-689 142	-50%
		Car 3	13 582	13 582	0%	588.91	150.77	-74%	8 064 323	2 040 233	-6 024 090	-74%
		Car 4	43 141	43 141	0%	504.48	32.40	-93%	21 783 989	3 986 141	-17 777 788	-82%
		Car 5	74 231	74 231	0%	434.16	32.40	-92%	32 223 283	6 658 730	-25 564 553	-79%
1.A.3.b.i - Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	4 921	4 921	0%	113.49	82.43	-27%	755 285	454 676	-300 609	-40%
		Car 1	148 068	148 068	0%	456.12	185.62	-59%	65 712 732	15 256 007	-50 456 726	-77%
		Car 2	149 994	149 994	0%	445.23	188.29	-58%	66 781 625	16 229 684	-50 551 941	-76%
		Car 3	881	881	0%	1076.81	1918.23	78%	964 197	988 234	24 037	2%
		Car 4	583	583	0%	731.36	732.67	0%	433 675	446 236	12 568	3%
		Car 5	4 375	4 375	0%	788.25	645.03	-18%	3 440 614	2 822 621	-617 993	-18%
	Diesel Oil	pre-Cars	10 333	10 333	0%	632.87	458.91	-28%	6 530 364	4 741 827	-1 787 536	-27%
		Car 1	43 141	43 141	0%	504.48	32.40	-93%	21 783 989	3 986 141	-17 777 788	-82%
		Car 2	74 231	74 231	0%	434.16	32.40	-92%	32 223 283	6 658 730	-25 564 553	-79%
		Car 3	4 921	4 921	0%	113.49	82.43	-27%	755 285	454 676	-300 609	-40%
		Car 4	148 068	148 068	0%	456.12	185.62	-59%	65 712 732	15 256 007	-50 456 726	-77%
		Car 5	149 994	149 994	0%	445.23	188.29	-58%	66 781 625	16 229 684	-50 551 941	-76%
	Diesel Oil	pre-Cars	881	881	0%	1076.81	1918.23	78%	964 197	988 234	24 037	2%
		Car 1	583	583	0%	731.36	732.67	0%	433 675	446 236	12 568	3%
		Car 2	4 375	4 375	0%	788.25	645.03	-18%	3 440 614	2 822 621	-617 993	-18%
		Car 3	10 333	10 333	0%	632.87	458.91	-28%	6 530 364	4 741 827	-1 787 536	-27%
		Car 4	43 141	43 141	0%	504.48	32.40	-93%	21 783 989	3 986 141	-17 777 788	-82%
		Car 5	74 231	74 231	0%	434.16	32.40	-92%	32 223 283	6 658 730	-25 564 553	-79%
	Gasoline	pre-Cars	9 126	9 126	0%	62.79	185.22	196%	573 066	1 680 431	1 107 365	196%
		Car 1	54 157	54 157	0%	404.73	388.24	-4%	23 082 189	16 885 117	-6 197 072	-27%
		Car 2	3 933	3 933	0%	1034.81	737.35	-29%	4 087 249	2 980 379	-1 106 870	-29%
		Car 3	1 555	1 555	0%	748.16	587.92	-22%	1 163 482	789 813	-373 669	-33%
		Car 4	8 875	8 875	0%	817.75	585.42	-28%	7 258 047	4 486 626	-2 771 421	-38%
		Car 5	34 167	34 167	0%	638.91	588.64	-9%	21 553 280	12 251 155	-9 302 125	-43%
1.A.3.b.ii - Heavy Duty Vehicles (HDVs)	Diesel Oil	pre-Cars	34 287	34 287	0%	396.94	281.86	-29%	9 640 384	6 885 621	-2 754 803	-29%
		Car 1	269 735	269 735	0%	267.22	153.60	-42%	74 680 233	39 976 610	-34 673 623	-48%
		Car 2	261 480	261 480	0%	61.77	153.60	149%	16 149 280	40 304 036	24 154 748	149%
		Trucks Total	594 013	594 013	0%	226.31	180.97	-20%	134 431 899	101 486 262	-32 945 637	-20%
	Gasoline	pre-Cars	5 543	5 543	0%	125.59	155.78	24%	696 072	883 289	187 218	24%
		Car 1	3 360	3 360	0%	127.11	177.29	39%	427 113	585 796	158 682	39%
		Car 2	3 375	3 375	0%	125.94	187.68	50%	421 961	687 078	265 117	63%
		Car 3	6 443	6 443	0%	48.36	187.68	281%	209 627	1 273 671	1 064 043	508%
		Car 4	85	85	0%	17.47	187.68	1031%	1 134	12 632	11 498	1011%
		Gasoline Total	16 185	16 185	0%	96.14	181.68	89%	1 885 897	3 452 476	1 566 579	89%
	1.A.3.b - Road Transport		2 267 339	2 267 339	0%	258.89	137.22	-46%	553 799 598	362 981 620	-190 817 978	-46%

Adjustment details for 2027												
NFR Code	Fuel	Activity Data			Implied Emission Factor			NO <sub>x</sub> Emissions				
		current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	difference	
		in [t]	in [t]	in [%]	in [g/t]	in [g/t]	in [%]	in [g]	in [g]	in [g]	in [%]	
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	12 282	12 282	0%	636.75	644.11	-14%	7 616 267	6 680 187	-1 126 108	-14%
		Car 1	17 449	17 449	0%	372.96	261.68	-30%	6 588 311	4 217 644	-2 391 267	-35%
		Car 2	30 435	30 435	0%	217.43	141.75	-35%	6 617 570	4 374 140	-2 243 430	-35%
		Car 3	54 271	54 271	0%	78.48	76.21	-3%	4 254 938	4 139 376	-115 562	-3%
		Car 4	315 086	315 086	0%	54.96	51.26	-7%	17 316 320	16 151 881	-1 164 438	-7%
		Car 5	180 240	180 240	0%	19.17	51.26	167%	3 485 382	9 239 815	5 754 433	167%
		Car 6	114 791	114 791	0%	25.65	51.26	102%	3 063 235	5 884 372	2 821 145	102%
		Gasoline total	724 571	724 571	0%	67.66	60.88	-10%	49 046 874	38 634 074	-10 406 800	-10%
	Diesel Oil	pre-Cars	1 370	1 370	0%	368.96	264.56	-13%	483 963	347 626	-136 883	-13%
		Car 1	3 760	3 760	0%	298.17	272.43	-9%	1 082 288	910 182	-172 106	-9%
		Car 2	13 788	13 788	0%	407.17	222.43	-45%	5 914 130	3 066 393	-2 847 736	-48%
		Car 3	52 128	52 128	0%	808.95	179.65	-78%	31 696 478	9 364 788	-22 331 690	-70%
		Car 4	187 047	187 047	0%	418.16	158.34	-61%	64 733 485	24 983 323	-39 740 162	-61%
		Car 5	283 480	283 480	0%	423.99	158.34	-63%	120 187 695	44 073 190	-76 114 505	-63%
		Car 6	184 768	184 768	0%	262.61	158.34	-40%	48 521 183	20 255 985	-28 265 198	-46%
		Diesel oil total	686 582	686 582	0%	398.65	161.95	-59%	272 126 081	112 890 717	-159 235 364	-59%
		Pkx Total	1 421 162	1 421 162	0%	225.98	155.61	-30%	52 152 965	163 448 435	-111 295 470	-48%
	Gasoline	pre-Cars	940	940	0%	611.41	645.95	-7%	612 247	606 978	-5 269	-1%
		Car 1	124	124	0%	308.23	312.78	15%	112 083	30 682	-73 401	-65%
Car 2		485	485	0%	806.12	221.62	-73%	141 344	182 555	41 214	29%	
Car 3		596	596	0%	118.17	115.35	-2%	63 265	60 812	-2 453	-4%	
Car 4		1 476	1 476	0%	68.72	53.38	-21%	74 877	70 816	-4 061	-5%	
Car 5		1 660	1 660	0%	21.73	53.38	149%	36 248	80 634	44 386	120%	
Car 6		910	910	0%	18.58	53.38	187%	17 022	40 080	23 058	137%	
Gasoline total		6 186	6 186	0%	515.15	161.18	-70%	1 068 199	1 034 251	-34 948	-3%	
Light Duty Vehicles (LDV)	pre-Cars	2 057	2 057	0%	413.41	389.79	-6%	880 489	611 183	-278 306	-26%	
	Car 1	1 538	1 538	0%	398.47	215.25	-45%	680 736	331 158	-349 578	-50%	
	Car 2	3 580	3 580	0%	325.28	155.44	-49%	1 431 793	687 233	-744 560	-50%	
	Car 3	11 654	11 654	0%	500.65	150.73	-70%	5 240 357	1 758 152	-3 482 205	-65%	
	Car 4	39 000	39 000	0%	56.76	83.03	47%	19 749 647	3 620 025	-16 129 622	-82%	
	Car 5	75 789	75 789	0%	432.66	83.03	-80%	32 790 966	7 054 565	-25 736 401	-79%	
	Car 6	19 625	19 625	0%	161.71	83.03	-49%	2 977 239	1 626 675	-1 350 564	-46%	
	Diesel oil total	153 284	153 284	0%	424.66	183.89	-57%	65 083 930	55 920 276	-9 163 654	-14%	
LDVs total	pre-Cars	199 470	199 470	0%	418.83	186.35	-56%	66 152 129	36 959 427	-29 192 702	-44%	
	Car 1	738	738	0%	1673.33	1512.23	-9%	790 259	510 425	-279 834	-35%	
	Car 2	411	411	0%	723.97	725.25	0%	380 684	389 082	8 398	2%	
	Car 3	3 325	3 325	0%	723.91	645.73	-10%	2 623 061	2 147 480	-475 581	-18%	
	Car 4	8 678	8 678	0%	613.23	459.12	-26%	5 478 480	3 984 085	-1 494 395	-27%	
	Car 5	3 023	3 023	0%	474.07	352.49	-26%	1 912 380	1 347 680	-564 700	-30%	
	Car 6	21 913	21 913	0%	363.92	186.84	-49%	7 937 975	4 053 686	-3 884 289	-49%	
	Diesel Oil	14 586	14 586	0%	68.52	186.84	270%	854 215	2 712 680	1 858 465	218%	
Diesel total	pre-Cars	53 582	53 582	0%	318.80	286.71	-9%	19 193 961	15 584 628	-3 609 333	-19%	
	Car 1	3 685	3 685	0%	1034.40	1 171.25	13%	3 730 272	2 659 076	-1 071 256	-29%	
	Car 2	1 781	1 781	0%	688.07	483.45	-30%	980 942	614 151	-366 896	-37%	
	Car 3	7 037	7 037	0%	817.96	585.58	-29%	5 794 676	3 580 026	-2 226 851	-38%	
	Car 4	26 868	26 868	0%	1 057.61	685.17	-35%	18 623 681	9 653 179	-8 970 502	-48%	
	Car 5	39 082	39 082	0%	397.77	279 304	-30%	7 964 414	5 687 456	-2 286 958	-30%	
	Car 6	264 365	264 365	0%	298.16	154.35	-47%	69 280 789	31 635 367	-37 645 342	-47%	
	Diesel Oil total	398 263	398 263	0%	65.82	154.35	135%	21 985 366	51 738 641	29 753 275	136%	
Trucks Total	pre-Cars	5 336	5 336	0%	125.91	157.13	25%	671 088	838 780	166 891	25%	
	Car 1	3 257	3 257	0%	126.39	177.06	41%	411 617	579 244	167 627	41%	
	Car 2	3 396	3 396	0%	122.55	196.32	62%	416 290	673 548	257 248	62%	
	Car 3	6 741	6 741	0%	44.22	186.32	320%	275 181	1 336 565	1 065 844	393%	
	Car 4	430	430	0%	18.26	196.32	1080%	7 782	86 275	77 493	963%	
	Car 5	0	0	0%	0.00	0.00	0%	0	0	0	0%	
	MWVs total	19 180	19 180	0%	82.83	183.39	98%	1 686 834	3 551 787	1 765 114	98%	
	1.A.3.b - Road Transport Total	current	2 291 437	2 291 437	0%	213.43	135.23	-40%	525 540 490	384 485 986	-141 054 504	-27%



Adjustment details for 2018												
NFR Code	Fuel	Activity Data			Implied Emission Factor			NO <sub>x</sub> Emissions				
		current	adjusted	difference in [%]	current	adjusted	difference in [%]	current	adjusted	adjustment	difference 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	-36%	5 371 161	3 448 643	-1 922 518	-36%
		Car 2	34 285	34 285	0%	221.97	111.68	-60%	5 360 977	2 688 163	-2 672 814	-50%
		Car 3	43 642	43 642	0%	88.16	76.96	-4%	3 487 781	3 388 617	-138 164	-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	186 830	186 830	0%	19.35	52.30	170%	3 228 282	8 725 688	5 497 406	170%
		Car 6	189 041	189 041	0%	6.00	52.30	0%	4 190 422	8 718 250	4 527 828	89%
	Diesel Oil	Gasoline total	689 027	689 027	0%	64.42	68.36	-6%	45 032 296	47 786 817	2 753 521	6%
		pre-Cars	1 363	1 363	0%	303.16	264.96	-16%	171 670	146 173	-25 497	-15%
		Car 1	2 949	2 949	0%	299.17	272.65	-9%	962 432	775 166	-187 267	-6%
		Car 2	10 784	10 784	0%	407.20	222.87	-45%	4 391 383	2 483 536	-1 907 848	-45%
		Car 3	40 786	40 786	0%	812.49	180.15	-71%	24 932 029	7 333 241	-17 598 788	-71%
		Car 4	130 534	130 534	0%	414.71	180.40	-61%	54 133 837	20 937 329	-33 196 508	-61%
		Car 5	251 212	251 212	0%	416.25	180.40	-61%	104 585 786	40 293 731	-64 292 055	-61%
		Car 6	228 685	228 685	0%	254.87	180.40	-31%	58 284 140	35 680 446	-22 603 700	-37%
		Diesel oil total	646 074	646 074	0%	375.66	163.38	-56%	247 596 063	188 748 684	-158 767 459	-56%
		Pkx Total	1 365 181	1 365 181	0%	214.34	114.68	-46%	262 589 060	156 535 421	-106 053 639	-46%
1.A.3.b.i - Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	911	911	0%	944.51	645.95	-1%	994 851	582 662	-4 107	-1%
		Car 1	188	188	0%	911.58	312.78	-66%	98 528	33 895	-64 633	-66%
		Car 2	377	377	0%	303.84	224.45	-26%	114 682	84 713	-29 969	-26%
		Car 3	511	511	0%	111.92	116.84	6%	57 282	60 739	3 457	6%
		Car 4	1 275	1 275	0%	52.02	54.36	4%	65 290	69 278	3 988	4%
		Car 5	1 483	1 483	0%	23.70	54.36	129%	35 160	80 626	45 466	129%
		Car 6	1 643	1 643	0%	19.18	54.36	182%	39 550	89 326	49 776	182%
	Diesel Oil	Gasoline total	6 315	6 315	0%	154.22	160.11	1%	999 199	1 091 138	11 939	1%
		pre-Cars	1 872	1 872	0%	411.51	386.79	-6%	771 337	574 742	-196 595	-26%
		Car 1	1 285	1 285	0%	389.94	276.28	-40%	483 128	272 296	-210 832	-40%
		Car 2	2 942	2 942	0%	318.56	193.88	-39%	965 389	550 789	-414 599	-39%
		Car 3	9 383	9 383	0%	598.10	150.74	-75%	5 689 152	1 411 299	-4 277 853	-75%
		Car 4	33 232	33 232	0%	508.42	93.81	-82%	16 929 185	3 117 457	-13 811 728	-82%
		Car 5	66 283	66 283	0%	432.92	93.81	-78%	28 684 080	6 217 860	-22 466 220	-78%
		Car 6	39 482	39 482	0%	158.79	93.81	-30%	5 941 615	3 686 228	-2 255 387	-30%
		Diesel oil total	154 259	154 259	0%	384.71	182.69	-71%	98 344 525	55 880 318	-42 464 215	-71%
		LDVs Total	180 574	180 574	0%	375.80	184.94	-72%	68 343 125	96 851 449	28 508 324	72%
1.A.3.b.ii - Heavy Duty Vehicles (HDVs)	Diesel Oil	pre-Cars	547	547	0%	1078.16	1919.23	-5%	585 267	557 147	-28 120	-5%
		Car 1	237	237	0%	732.78	132.57	-82%	173 678	178 368	4 690	3%
		Car 2	2 270	2 270	0%	787.83	646.33	-18%	1 780 686	1 487 437	-293 249	-16%
		Car 3	6 757	6 757	0%	638.89	459.32	-27%	4 262 734	3 183 482	-1 079 252	-27%
		Car 4	3 043	3 043	0%	473.16	382.73	-20%	1 439 790	1 073 333	-366 457	-25%
		Car 5	18 189	18 189	0%	362.42	186.37	-49%	6 463 265	3 376 016	-3 087 249	-49%
		Car 6	20 670	20 670	0%	64.89	186.37	288%	1 176 026	3 682 314	2 506 288	288%
	Trucks & Lorries	Buses Total	91 634	91 634	0%	309.75	283.53	-10%	15 993 546	13 687 186	-2 306 428	-15%
		pre-Cars	3 262	3 262	0%	1034.82	737.35	-29%	3 375 359	2 485 071	-890 288	-29%
		Car 1	1 094	1 094	0%	747.82	488.39	-37%	918 052	512 378	-405 674	-37%
		Car 2	5 544	5 544	0%	817.44	581.68	-29%	4 532 180	2 781 516	-1 750 664	-39%
		Car 3	20 583	20 583	0%	629.54	563.68	-10%	12 367 751	7 277 279	-5 090 472	-44%
		Car 4	15 912	15 912	0%	358.89	276.23	-21%	6 334 421	4 386 424	-1 947 997	-31%
		Car 5	154 983	154 983	0%	292.40	154.68	-47%	45 964 153	24 283 389	-21 680 764	-47%
		Car 6	381 799	381 799	0%	68.78	154.68	125%	28 251 482	69 665 886	41 414 404	125%
		Trucks Total	585 186	585 186	0%	515.18	172.19	-1%	188 173 537	180 710 889	-7 462 648	-4%
1.A.3.b.iii - Motorised Two-Wheelers (MTWs)	Gasoline	pre-Cars	4 940	4 940	0%	128.95	188.61	20%	622 666	783 451	160 785	26%
		Car 1	2 966	2 966	0%	128.14	177.79	41%	374 114	527 294	153 180	41%
		Car 2	3 221	3 221	0%	128.33	188.64	65%	387 596	639 833	252 237	65%
		Car 3	6 241	6 241	0%	48.24	188.64	384%	251 126	1 239 688	988 562	384%
		Car 4	1 130	1 130	0%	58.41	188.64	82%	23 066	224 682	201 616	87%
		Car 5	0	0	0%	0.00		0%	0	0	0	0%
		MTWs Total	18 487	18 487	0%	85.88	188.61	198%	1 658 558	3 454 167	1 795 609	198%
	Road Transport	Total	2 180 983	2 180 983	0%	215.85	133.49	-38%	478 758 286	291 129 652	-187 628 634	-38%

Adjustment details for 2019													
NFR Code	Fuel	Activity Data				Implied Emission Factor				NO <sub>x</sub> Emissions			
		current	adjusted	difference	in [%]	current	adjusted	difference	in [%]	current	adjusted	adjustment	difference in [%]
1.A.3.a.i - Passenger Cars	Gasoline	pre-Cars	13 588	13 588	0%	638.58	644.11	-6%	-10%	8 664 521	7 382 688	-1 281 833	-15%
		Car 1	12 427	12 427	0%	378.32	341.68	-36%	-36%	4 781 480	3 083 383	-1 698 096	-36%
		Car 2	20 086	20 086	0%	225.58	92.58	-60%	-60%	4 531 070	1 858 078	-2 672 852	-60%
		Car 3	38 216	38 216	0%	82.22	76.12	-5%	-5%	2 977 840	2 829 186	-148 653	-5%
		Car 4	295 220	295 220	0%	57.04	53.29	-7%	-7%	14 588 285	13 589 621	-998 664	-7%
		Car 5	180 537	180 537	0%	19.77	53.29	170%	170%	3 173 728	8 054 356	4 880 628	170%
		Car 6	285 626	285 626	0%	25.63	53.29	180%	180%	5 295 099	11 010 782	5 715 683	180%
	Gasoline total	784 631	784 631	0%	62.36	68.45	16%	16%	43 961 941	48 238 025	4 276 084	16%	
	pre-Cars	2 736	2 736	0%	333.76	264.56	-21%	-21%	913 180	724 923	-188 257	-21%	
	Car 1	2 545	2 545	0%	299.80	272.65	-9%	-9%	766 913	687 786	-79 127	-9%	
	Car 2	8 891	8 891	0%	407.19	229.16	-44%	-44%	3 620 286	2 037 480	-1 582 806	-44%	
	Car 3	33 079	33 079	0%	815.11	180.42	-71%	-71%	20 370 125	5 967 483	-14 402 642	-71%	
	Car 4	111 335	111 335	0%	419.17	182.44	-61%	-61%	48 688 685	18 085 622	-30 603 063	-61%	
	Car 5	231 784	231 784	0%	419.37	182.44	-60%	-60%	95 117 643	37 650 997	-57 466 646	-60%	
	Car 6	273 511	273 511	0%	227.36	182.44	-20%	-20%	62 183 230	44 429 184	-17 754 046	-29%	
	Diesel oil total	663 841	663 841	0%	345.81	165.67	-52%	-52%	229 566 088	189 582 982	-139 983 106	-52%	
	Pkx Total	1 368 532	1 368 532	0%	699.83	155.19	-46%	-46%	273 668 029	157 821 087	-115 846 942	-46%	
1.A.3.b.i - Light Duty Vehicles (LDVs)	Gasoline	pre-Cars	909	909	0%	644.89	645.95	-1%	-1%	881 459	581 962	-2 997	-1%
		Car 1	87	87	0%	915.28	312.78	-66%	-66%	88 953	30 396	-58 557	-66%
		Car 2	316	316	0%	304.63	224.45	-26%	-26%	96 158	70 848	-25 310	-26%
		Car 3	447	447	0%	112.68	121.47	8%	8%	59 355	54 283	-5 072	-8%
		Car 4	1 126	1 126	0%	53.08	55.26	4%	4%	59 652	62 199	2 547	4%
		Car 5	1 361	1 361	0%	25.34	55.26	119%	119%	34 240	74 680	40 440	119%
		Car 6	2 420	2 420	0%	18.75	55.26	180%	180%	45 383	133 753	88 370	180%
	Gasoline total	6 483	6 483	0%	144.88	153.25	5%	5%	974 279	1 094 150	11 871	5%	
	pre-Cars	1 744	1 744	0%	418.96	386.79	-6%	-6%	725 111	541 376	-183 735	-26%	
	Car 1	1 079	1 079	0%	389.52	276.28	-40%	-40%	420 285	232 256	-188 029	-40%	
	Car 2	2 334	2 334	0%	315.90	194.79	-39%	-39%	737 682	454 630	-283 052	-39%	
	Car 3	7 649	7 649	0%	801.11	150.79	-71%	-71%	4 597 943	1 152 737	-3 445 206	-75%	
	Car 4	28 714	28 714	0%	512.28	94.57	-82%	-82%	14 788 306	2 716 154	-11 972 154	-82%	
	Car 5	58 774	58 774	0%	434.30	94.57	-79%	-79%	25 499 580	5 032 428	-19 467 152	-79%	
	Car 6	69 931	69 931	0%	148.18	94.57	-36%	-36%	3 614 586	5 672 892	2 058 306	57%	
	Diesel oil total	159 183	159 183	0%	347.42	181.90	-47%	-47%	56 383 335	36 221 445	-20 161 890	-47%	
	LDVs total	165 866	165 866	0%	339.31	183.89	-46%	-46%	56 279 554	35 245 936	-21 033 618	-46%	
1.A.3.b.ii - Heavy Duty Vehicles (HDVs)	Diesel Oil	pre-Cars	489	489	0%	1080.20	1019.23	-6%	-6%	585 887	476 258	-109 629	-19%
		Car 1	147	147	0%	738.37	732.57	-1%	-1%	188 212	110 593	-77 619	-41%
		Car 2	1 611	1 611	0%	709.47	666.77	-7%	-7%	2 097 343	1 941 621	-155 722	-8%
		Car 3	5 789	5 789	0%	824.86	439.85	-47%	-47%	7 066 381	3 742 779	-3 323 602	-47%
		Car 4	2 747	2 747	0%	473.93	352.84	-26%	-26%	1 382 061	960 413	-421 648	-30%
		Car 5	17 130	17 130	0%	362.91	186.64	-49%	-49%	6 212 175	3 180 781	-3 031 394	-49%
		Car 6	25 135	25 135	0%	60.43	186.64	299%	299%	1 518 961	4 086 133	2 567 172	299%
	Diesel total	52 939	52 939	0%	274.41	247.85	-16%	-16%	14 547 072	15 158 078	610 486	4%	
	pre-Cars	3 140	3 140	0%	1034.96	737.35	-29%	-29%	3 260 020	2 376 443	-883 577	-29%	
	Car 1	969	969	0%	747.60	488.34	-35%	-35%	724 240	453 754	-270 486	-37%	
	Car 2	4 560	4 560	0%	817.42	581.14	-29%	-29%	3 734 343	2 280 967	-1 453 376	-39%	
	Car 3	16 377	16 377	0%	881.94	381.93	-57%	-57%	12 066 383	5 750 747	-6 315 636	-57%	
	Car 4	13 137	13 137	0%	598.96	279.43	-54%	-54%	3 226 679	3 049 330	-1 646 349	-51%	
	Car 5	125 233	125 233	0%	26.13	154.90	490%	490%	36 960 599	59 481 429	22 520 830	61%	
	Car 6	432 480	432 480	0%	72.98	154.92	110%	110%	31 175 449	67 083 865	35 828 365	180%	
	Trucks Total	595 913	595 913	0%	553.39	189.17	-66%	-66%	55 380 190	18 889 376	-3 648 618	-16%	
	1.A.3.b.iii - Motorized Two-Wheelers (MOWs)	Gasoline	pre-Cars	4 813	4 813	0%	125.89	164.78	31%	31%	664 997	732 771	167 774
Car 1			2 035	2 035	0%	125.39	177.29	41%	41%	355 495	582 589	227 094	64%
Car 2			3 084	3 084	0%	119.33	190.06	67%	67%	303 224	610 757	307 533	101%
Car 3			6 082	6 082	0%	48.81	188.06	287%	287%	204 284	1 252 817	1 048 533	511%
Car 4			2 068	2 068	0%	21.69	188.06	871%	871%	23 489	386 467	362 978	1548%
Car 5			0	0	0%	0.00		0%	0%	0	0	0	0%
MOWs Total			18 160	18 160	0%	86.09	186.83	115%	115%	1 613 580	3 582 941	1 969 361	115%
1.A.3.b. Road Transport		Total	2 262 080	2 262 080	0%	198.58	132.83	-33%	-33%	437 206 744	292 497 497	-144 709 248	-33%

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Adjustment 2014 (accepted)	-105.6	-101.3	-95.7	-91.7						
Adjustment 2015 (accepted)	-100.3	-95.5	-89.9	-85.1						
Adjustment 2016 (accepted)	-151.3	-146.9	-145.1	-142.5	-128.1					
Adjustment 2017 (accepted)	-151.3	-146.8	-145.0	-142.4	-127.2	-100.9				
Adjustment 2018 (accepted)	-172.3	-174.5	-177.4	-180.4	-171.5	-148.9	-123.2			
Adjustment 2019 (accepted)	-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	
<b>Adjustment 2021 (proposal)</b>	<b>-296.1</b>	<b>-300.7</b>	<b>-300.4</b>	<b>-305.2</b>	<b>-294.9</b>	<b>-274.9</b>	<b>-250.9</b>	<b>-221.1</b>	<b>-179.6</b>	<b>-144.8</b>
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".<sup>8)</sup>

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 ><sup>9)</sup> strongly effecting the TREMOD model underlying Germany's emission reporting for road transport and hence any adjustments of NO<sub>x</sub> emissions.

**With such major model revision between submissions 2019 and 2020, the current adjustment proposal differs significantly from the adjustment applied for and accepted in 2019.**

#### **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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