

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 2002 ⁵⁾, 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 | current | adjusted | difference | current | adjusted | adjustment | difference |
| | | | in [TJ] | in [TJ] | in [%] | in [kg/TJ] | in [kg/TJ] | in [%] | in [kg] | in [kg] | in [kg] | in [%] |
| 1.A.3.b.i | gasoline | | 795.957 | 795.957 | 0% | 97.55 | 84.99 | -13% | 77.644.842 | 67.690.906 | 9.953.935 | -13% |
| 1.A.3.b.i | diesel oil | | 629.380 | 629.380 | 0% | 429.45 | 160.51 | -63% | 227.341.096 | 84.970.461 | 142.370.635 | -63% |
| 1.A.3.b.ii | gasoline | | 6.325 | 6.325 | 0% | 255.87 | 214.75 | -16% | 1.618.432 | 1.358.328 | 260.104 | -16% |
| 1.A.3.b.ii | diesel oil | | 113.450 | 113.450 | 0% | 475.34 | 134.96 | -72% | 54.040.533 | 15.311.584 | 38.728.949 | -72% |
| 1.A.3.b.iii | gasoline | | 48.844 | 48.844 | 0% | 823.00 | 482.55 | -42% | 29.931.266 | 23.183.732 | 6.747.534 | -23% |
| 1.A.3.b.iii | diesel oil | | 566.741 | 566.741 | 0% | 446.67 | 271.83 | -39% | 253.148.243 | 154.056.160 | 99.092.083 | -39% |
| 1.A.3.b.iv | gasoline | | 19.712 | 19.712 | 0% | 113.68 | 168.43 | 48% | 2.240.749 | 3.320.034 | -1.079.285 | -48% |
| 1.A.3.b TOTAL | | 2010 | 2.079.608 | 2.079.608 | 0% | | | 0% | 645.965.162 | 349.851.206 | 296.113.956 | -46% |
| 1.A.3.b.i | gasoline | | 794.688 | 794.688 | 0% | 92.09 | 81.61 | -11% | 73.185.851 | 64.851.951 | 8.333.900 | -11% |
| 1.A.3.b.i | diesel oil | | 553.564 | 553.564 | 0% | 434.12 | 159.22 | -63% | 240.313.791 | 88.138.959 | 152.174.832 | -63% |
| 1.A.3.b.ii | gasoline | | 6.118 | 6.118 | 0% | 229.35 | 198.57 | -13% | 1.403.081 | 1.214.776 | 188.305 | -13% |
| 1.A.3.b.ii | diesel oil | | 115.967 | 115.967 | 0% | 481.55 | 126.92 | -74% | 55.844.518 | 14.718.142 | 41.126.376 | -74% |
| 1.A.3.b.iii | gasoline | | 47.355 | 47.355 | 0% | 592.65 | 448.99 | -24% | 28.071.221 | 21.268.323 | 6.804.898 | -24% |
| 1.A.3.b.iii | diesel oil | | 563.891 | 563.891 | 0% | 410.38 | 244.97 | -40% | 231.410.271 | 138.135.342 | 93.273.929 | -40% |
| 1.A.3.b.iv | gasoline | | 19.289 | 19.289 | 0% | 110.79 | 171.60 | 54% | 2.137.002 | 3.299.162 | -1.162.160 | -54% |
| 1.A.3.b TOTAL | | 2011 | 2.106.883 | 2.106.883 | 0% | | | 0% | 632.365.736 | 331.625.655 | 300.740.081 | -48% |
| 1.A.3.b.i | gasoline | | 750.957 | 750.957 | 0% | 85.73 | 78.00 | -9% | 64.379.994 | 58.677.229 | 5.802.765 | -9% |
| 1.A.3.b.i | diesel oil | | 555.245 | 555.245 | 0% | 435.96 | 158.66 | -64% | 242.062.902 | 88.096.699 | 153.966.203 | -64% |
| 1.A.3.b.ii | gasoline | | 5.657 | 5.657 | 0% | 218.93 | 193.15 | -12% | 1.238.520 | 1.092.662 | 145.859 | -12% |
| 1.A.3.b.ii | diesel oil | | 114.350 | 114.350 | 0% | 481.91 | 128.17 | -75% | 55.106.362 | 13.741.354 | 41.365.008 | -75% |
| 1.A.3.b.iii | gasoline | | 50.902 | 50.902 | 0% | 533.22 | 384.33 | -28% | 27.141.913 | 19.563.200 | 7.578.704 | -28% |
| 1.A.3.b.iii | diesel oil | | 589.585 | 589.585 | 0% | 381.33 | 224.00 | -41% | 234.829.180 | 132.064.753 | 102.764.428 | -41% |
| 1.A.3.b.iv | gasoline | | 18.268 | 18.268 | 0% | 107.43 | 173.28 | 61% | 1.962.546 | 3.165.439 | -1.202.893 | -61% |
| 1.A.3.b TOTAL | | 2012 | 2.084.964 | 2.084.964 | 0% | | | 0% | 616.721.438 | 316.391.343 | 300.429.094 | -49% |
| 1.A.3.b.i | gasoline | | 749.114 | 749.114 | 0% | 89.35 | 74.85 | -7% | 60.190.007 | 56.071.797 | 4.118.211 | -7% |
| 1.A.3.b.i | diesel oil | | 589.131 | 589.131 | 0% | 437.14 | 158.71 | -64% | 257.633.728 | 93.499.010 | 164.134.718 | -64% |
| 1.A.3.b.ii | gasoline | | 5.578 | 5.578 | 0% | 202.80 | 184.07 | -9% | 1.131.209 | 1.026.727 | 104.482 | -9% |
| 1.A.3.b.ii | diesel oil | | 118.777 | 118.777 | 0% | 480.60 | 114.93 | -76% | 57.083.533 | 13.690.488 | 43.433.045 | -76% |
| 1.A.3.b.iii | gasoline | | 51.716 | 51.716 | 0% | 509.64 | 368.06 | -29% | 26.350.969 | 18.620.843 | 7.730.126 | -29% |
| 1.A.3.b.iii | diesel oil | | 600.139 | 600.139 | 0% | 353.06 | 287.93 | -19% | 211.887.531 | 124.788.469 | 87.099.062 | -41% |
| 1.A.3.b.iv | gasoline | | 18.229 | 18.229 | 0% | 104.34 | 175.38 | 68% | 1.902.688 | 3.197.038 | -1.294.351 | -68% |
| 1.A.3.b TOTAL | | 2013 | 2.132.683 | 2.132.683 | 0% | | | 0% | 616.079.063 | 316.854.371 | 300.224.692 | -50% |
| 1.A.3.b.i | gasoline | | 752.526 | 752.526 | 0% | 76.03 | 73.09 | -4% | 57.215.533 | 54.988.921 | 2.216.612 | -4% |
| 1.A.3.b.i | diesel oil | | 626.845 | 626.845 | 0% | 435.87 | 159.12 | -63% | 272.876.061 | 95.613.892 | 177.262.169 | -63% |
| 1.A.3.b.ii | gasoline | | 5.845 | 5.845 | 0% | 190.34 | 176.49 | -7% | 1.112.584 | 1.031.612 | 80.972 | -7% |
| 1.A.3.b.ii | diesel oil | | 128.578 | 128.578 | 0% | 475.56 | 110.96 | -77% | 61.546.575 | 14.267.237 | 46.879.338 | -77% |
| 1.A.3.b.iii | gasoline | | 49.143 | 49.143 | 0% | 468.37 | 339.99 | -27% | 23.017.115 | 16.708.234 | 6.308.881 | -27% |
| 1.A.3.b.iii | diesel oil | | 572.754 | 572.754 | 0% | 314.05 | 196.05 | -38% | 179.874.133 | 112.285.582 | 67.588.551 | -38% |
| 1.A.3.b.iv | gasoline | | 18.673 | 18.673 | 0% | 100.59 | 179.24 | 78% | 1.878.294 | 3.345.794 | -1.467.499 | -78% |
| 1.A.3.b TOTAL | | 2014 | 2.153.563 | 2.153.563 | 0% | | | 0% | 597.120.297 | 302.252.271 | 294.868.025 | -49% |
| 1.A.3.b.i | gasoline | | 715.156 | 715.156 | 0% | 74.38 | 71.73 | -4% | 53.190.787 | 51.300.983 | 1.889.805 | -4% |
| 1.A.3.b.i | diesel oil | | 645.555 | 645.555 | 0% | 426.19 | 159.80 | -63% | 275.130.233 | 103.163.501 | 171.966.732 | -63% |
| 1.A.3.b.ii | gasoline | | 5.793 | 5.793 | 0% | 187.12 | 172.80 | -8% | 1.083.927 | 1.000.999 | 82.928 | -8% |
| 1.A.3.b.ii | diesel oil | | 135.386 | 135.386 | 0% | 489.35 | 187.96 | -77% | 63.605.443 | 14.607.490 | 48.997.953 | -77% |
| 1.A.3.b.iii | gasoline | | 52.287 | 52.287 | 0% | 458.96 | 327.99 | -29% | 23.997.817 | 17.149.448 | 6.848.370 | -29% |
| 1.A.3.b.iii | diesel oil | | 589.411 | 589.411 | 0% | 266.69 | 187.51 | -30% | 157.189.675 | 110.620.703 | 46.568.973 | -30% |
| 1.A.3.b.iv | gasoline | | 18.459 | 18.459 | 0% | 99.32 | 180.65 | 82% | 1.833.362 | 3.334.472 | -1.501.090 | -82% |
| 1.A.3.b TOTAL | | 2015 | 2.161.976 | 2.161.976 | 0% | | | 0% | 575.931.265 | 301.877.596 | 274.053.670 | -48% |
| 1.A.3.b.i | gasoline | | 715.272 | 715.272 | 0% | 79.93 | 76.65 | -4% | 50.736.367 | 50.535.049 | 201.318 | 0% |
| 1.A.3.b.i | diesel oil | | 675.119 | 675.119 | 0% | 410.36 | 160.76 | -61% | 277.041.660 | 108.535.230 | 168.506.430 | -61% |
| 1.A.3.b.ii | gasoline | | 5.926 | 5.926 | 0% | 180.27 | 171.05 | -5% | 1.068.292 | 1.013.678 | 54.614 | -5% |
| 1.A.3.b.ii | diesel oil | | 144.068 | 144.068 | 0% | 456.12 | 185.62 | -77% | 65.712.732 | 15.216.007 | 50.496.725 | -77% |
| 1.A.3.b.iii | gasoline | | 54.157 | 54.157 | 0% | 424.73 | 388.24 | -7% | 23.002.109 | 16.833.117 | 6.168.992 | -27% |
| 1.A.3.b.iii | diesel oil | | 594.013 | 594.013 | 0% | 226.31 | 180.97 | -20% | 134.431.699 | 107.496.262 | 26.935.437 | -20% |
| 1.A.3.b.iv | gasoline | | 18.785 | 18.785 | 0% | 95.14 | 181.66 | 89% | 1.805.897 | 3.412.476 | -1.606.579 | -89% |
| 1.A.3.b TOTAL | | 2016 | 2.207.339 | 2.207.339 | 0% | | | 0% | 553.790.558 | 302.901.820 | 250.897.738 | -45% |
| 1.A.3.b.i | gasoline | | 724.571 | 724.571 | 0% | 67.66 | 69.88 | 3% | 49.026.074 | 50.634.714 | -1.608.640 | -3% |
| 1.A.3.b.i | diesel oil | | 696.592 | 696.592 | 0% | 390.65 | 161.95 | -59% | 272.126.091 | 112.810.721 | 159.315.370 | -59% |
| 1.A.3.b.ii | gasoline | | 6.186 | 6.186 | 0% | 171.15 | 167.18 | -2% | 1.058.799 | 1.034.211 | 24.588 | -2% |
| 1.A.3.b.ii | diesel oil | | 153.284 | 153.284 | 0% | 424.66 | 183.89 | -57% | 65.093.930 | 15.925.216 | 49.168.714 | -76% |
| 1.A.3.b.iii | gasoline | | 53.382 | 53.382 | 0% | 370.80 | 286.71 | -23% | 19.793.901 | 15.304.828 | 4.489.073 | -23% |
| 1.A.3.b.iii | diesel oil | | 596.263 | 596.263 | 0% | 195.02 | 175.92 | -10% | 116.671.141 | 106.246.508 | 10.424.633 | -10% |
| 1.A.3.b.iv | gasoline | | 19.160 | 19.160 | 0% | 92.83 | 183.39 | 98% | 1.778.674 | 3.513.787 | -1.735.114 | -98% |
| 1.A.3.b TOTAL | | 2017 | 2.251.437 | 2.251.437 | 0% | | | 0% | 525.549.410 | 304.469.986 | 221.079.424 | -42% |
| 1.A.3.b.i | gasoline | | 699.027 | 699.027 | 0% | 64.42 | 68.36 | 6% | 45.032.566 | 47.786.817 | -2.753.250 | -6% |
| 1.A.3.b.i | diesel oil | | 666.074 | 666.074 | 0% | 371.66 | 163.30 | -56% | 247.556.063 | 108.768.604 | 138.787.459 | -56% |
| 1.A.3.b.ii | gasoline | | 6.315 | 6.315 | 0% | 158.22 | 160.11 | 1% | 999.199 | 1.011.138 | -11.939 | -1% |
| 1.A.3.b.ii | diesel oil | | 154.259 | 154.259 | 0% | 384.71 | 182.69 | -73% | 59.344.525 | 15.840.310 | 43.504.215 | -73% |
| 1.A.3.b.iii | gasoline | | 51.634 | 51.634 | 0% | 309.75 | 263.53 | -15% | 15.993.526 | 13.607.106 | 2.386.420 | -15% |
| 1.A.3.b.iii | diesel oil | | 585.186 | 585.186 | 0% | 171.18 | 172.10 | 1% | 180.173.337 | 180.710.869 | -537.532 | -1% |
| 1.A.3.b.iv | gasoline | | 18.497 | 18.497 | 0% | 89.66 | 184.61 | 106% | 1.658.588 | 3.414.767 | -1.756.209 | -106% |
| 1.A.3.b TOTAL | | 2018 | 2.180.993 | 2.180.993 | 0% | | | 0% | 478.758.206 | 291.139.612 | 179.618.593 | -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 | | 663.841 | 663.841 | 0% | 345.81 | 165.07 | -52% | 229.566.088 | 109.582.982 | 119.983.106 | -52% |
| 1.A.3.b.ii | gasoline | | 6.683 | 6.683 | 0% | 146.08 | 153.25 | 5% | 976.219 | 1.034.150 | -57.931 | -5% |
| 1.A.3.b.ii | diesel oil | | 159.183 | 159.183 | 0% | 347.42 | 181.90 | -47% | 55.303.535 | 16.221.445 | 39.082.090 | -71% |
| 1.A.3.b.iii | gasoline | | 52.939 | 52.939 | 0% | 274.41 | 247.81 | -10% | 14.527.012 | 13.118.578 | 1.408.434 | -10% |
| 1.A.3.b.iii | diesel oil | | 595.913 | 595.913 | 0% | 153.35 | 169.17 | 10% | 91.380.760 | 106.809.376 | -15.428.616 | -16% |
| 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 | 2.202.880 | 2.202.880 | 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 _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [t] | in [t] | in [t] | in [t] | |
| 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 | -658.143 | -8% |
| | | Car 1 | 36.541 | 36.541 | 0% | 338.50 | 297.71 | -12% | 25.915.925 | 19.189.262 | -7.716.663 | -30% |
| | | Car 2 | 96.425 | 96.425 | 0% | 172.95 | 135.63 | -22% | 16.580.020 | 13.020.026 | -3.569.995 | -22% |
| | | Car 3 | 133.139 | 133.139 | 0% | 58.51 | 70.19 | 20% | 7.790.384 | 9.343.433 | 1.553.129 | 20% |
| | | Car 4 | 444.991 | 444.991 | 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 | 2 | 0 | 0% |
| | | Gasoline total | 795.057 | 795.057 | 0% | 99.25 | 84.39 | -13% | 77.646.042 | 67.650.586 | -9.995.456 | -13% |
| | Diesel Oil | pre-Cars | 1.915 | 1.915 | 0% | 318.13 | 264.95 | -17% | 583.760 | 527.256 | -56.504 | -10% |
| | | Car 1 | 10.338 | 10.338 | 0% | 266.42 | 245.17 | -11% | 3.064.428 | 2.741.387 | -323.041 | -11% |
| | | Car 2 | 50.088 | 50.088 | 0% | 406.90 | 299.19 | -26% | 20.372.795 | 10.974.210 | -9.398.584 | -46% |
| | | Car 3 | 134.025 | 134.025 | 0% | 542.54 | 176.54 | -67% | 72.645.173 | 23.929.276 | -48.715.897 | -67% |
| | | Car 4 | 279.154 | 279.154 | 0% | 384.37 | 140.58 | -63% | 107.299.180 | 39.243.811 | -68.055.369 | -63% |
| | | 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% |
| | | Pkx Total | 1.325.337 | 1.325.337 | 0% | 238.12 | 155.14 | -36% | 364.985.938 | 152.621.367 | -212.364.570 | -58% |
| | Gasoline | pre-Cars | 1.249 | 1.249 | 0% | 627.99 | 645.95 | 1% | 783.320 | 986.871 | 203.551 | 26% |
| | | Car 1 | 367 | 367 | 0% | 361.95 | 297.39 | -16% | 361.969 | 186.620 | -175.349 | -49% |
| | | Car 2 | 1.393 | 1.393 | 0% | 264.75 | 184.41 | -30% | 368.840 | 256.917 | -111.923 | -30% |
| | | Car 3 | 856 | 856 | 0% | 82.47 | 30.83 | -63% | 70.631 | 77.625 | 6.994 | 10% |
| | | Car 4 | 2.420 | 2.420 | 0% | 36.32 | 44.90 | 24% | 87.987 | 188.679 | 100.692 | 114% |
| | | Car 5 | 49 | 49 | 0% | 15.34 | 44.90 | 193% | 750 | 2.218 | 1.468 | 193% |
| | | Car 6 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Gasoline total | 6.345 | 6.345 | 0% | 255.87 | 254.75 | -0% | 1.478.832 | 1.358.128 | -120.704 | -8% |
| 1.A.3.b.i. Light Duty Vehicles (LDVs) | Gasoline | pre-Cars | 4.876 | 4.876 | 0% | 425.99 | 386.79 | -9% | 2.077.142 | 1.436.983 | -640.159 | -31% |
| | | Car 1 | 9.989 | 9.989 | 0% | 398.18 | 276.24 | -30% | 2.389.080 | 1.289.636 | -1.099.444 | -46% |
| | | Car 2 | 13.126 | 13.126 | 0% | 336.76 | 153.18 | -54% | 4.420.280 | 2.534.731 | -1.885.549 | -43% |
| | | Car 3 | 33.249 | 33.249 | 0% | 531.91 | 150.58 | -72% | 17.655.883 | 5.085.760 | -12.570.123 | -72% |
| | | Car 4 | 54.581 | 54.581 | 0% | 491.42 | 80.69 | -84% | 26.021.036 | 4.940.722 | -21.080.314 | -80% |
| | | Car 5 | 1.629 | 1.629 | 0% | 427.50 | 80.69 | -81% | 696.286 | 144.434 | -551.852 | -80% |
| | | Car 6 | 0 | 0 | 0% | 15.73 | 80.69 | 417% | 7 | 4 | -3 | -43% |
| | | Diesel oil total | 113.450 | 113.450 | 0% | 476.34 | 134.94 | -72% | 54.043.533 | 15.311.584 | -38.731.949 | -72% |
| | | LDVs Total | 119.775 | 119.775 | 0% | 464.70 | 139.18 | -70% | 55.658.966 | 16.648.913 | -39.010.053 | -70% |
| | Diesel Oil | pre-Cars | 3.382 | 3.382 | 0% | 1096.25 | 1028.78 | -6% | 3.674.087 | 3.452.644 | -221.443 | -6% |
| | | Car 1 | 2.826 | 2.826 | 0% | 749.41 | 732.14 | -2% | 2.117.871 | 2.125.595 | 7.723 | 0% |
| | | Car 2 | 10.152 | 10.152 | 0% | 801.96 | 643.47 | -20% | 8.140.119 | 6.532.213 | -1.607.906 | -20% |
| | | Car 3 | 15.890 | 15.890 | 0% | 633.22 | 437.25 | -30% | 10.865.776 | 7.289.299 | -3.576.477 | -33% |
| | | Car 4 | 5.461 | 5.461 | 0% | 448.63 | 351.65 | -21% | 2.650.016 | 1.921.527 | -728.489 | -28% |
| | | Car 5 | 10.326 | 10.326 | 0% | 337.28 | 182.33 | -46% | 3.882.417 | 1.882.644 | -1.999.773 | -51% |
| | | Car 6 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Buses Total | 48.044 | 48.044 | 0% | 623.80 | 482.55 | -23% | 29.931.266 | 23.183.732 | -6.747.534 | -23% |
| | Diesel Oil | pre-Cars | 10.185 | 10.185 | 0% | 1040.16 | 787.37 | -24% | 10.510.623 | 7.754.138 | -2.756.485 | -26% |
| | | Car 1 | 5.677 | 5.677 | 0% | 758.59 | 575.55 | -24% | 4.261.383 | 3.287.681 | -973.702 | -23% |
| | | Car 2 | 38.555 | 38.555 | 0% | 817.62 | 524.79 | -35% | 31.525.526 | 20.234.619 | -11.290.907 | -36% |
| | | Car 3 | 169.023 | 169.023 | 0% | 636.28 | 274.48 | -56% | 161.136.182 | 59.617.271 | -101.518.911 | -63% |
| | | Car 4 | 69.635 | 69.635 | 0% | 368.34 | 280.62 | -24% | 27.183.867 | 20.146.636 | -7.037.231 | -26% |
| | | Car 5 | 283.934 | 283.934 | 0% | 276.42 | 151.65 | -45% | 78.643.643 | 43.115.897 | -35.527.746 | -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% | 293.148.243 | 154.696.160 | -138.452.083 | -47% |
| | Gasoline | pre-Cars | 7.973 | 7.973 | 0% | 122.80 | 149.18 | 22% | 372.721 | 1.189.393 | 216.672 | 58% |
| | | Car 1 | 5.231 | 5.231 | 0% | 123.77 | 165.74 | 34% | 647.479 | 887.039 | 239.560 | 37% |
| | | Car 2 | 3.587 | 3.587 | 0% | 141.16 | 184.21 | 31% | 585.362 | 686.681 | 101.319 | 17% |
| | | Car 3 | 2.950 | 2.950 | 0% | 38.11 | 184.21 | 381% | 116.180 | 657.032 | 540.852 | 465% |
| | | Car 4 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | Car 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% |
| | | LDVs Total | 19.172 | 19.172 | 0% | 113.68 | 148.43 | 30% | 2.243.149 | 3.326.034 | 1.082.885 | 48% |
| | | 1.A.3.b. Road Transport | 2.879.688 | 2.879.688 | 0% | 219.62 | 148.23 | -33% | 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 | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [t] | in [t] | in [t] | in [t] | |
| 1.A.3.a.i. Passenger Cars | Gasoline | pre-Cars | 13.063 | 13.063 | 0% | 592.96 | 534.68 | -9% | 7.720.235 | 6.979.435 | -740.801 | -9% |
| | | Car 1 | 61.979 | 61.979 | 0% | 347.86 | 340.16 | -2% | 21.560.430 | 14.884.961 | -6.675.479 | -31% |
| | | Car 2 | 87.083 | 87.083 | 0% | 178.38 | 136.58 | -24% | 15.620.983 | 11.883.782 | -3.737.191 | -24% |
| | | Car 3 | 124.330 | 124.330 | 0% | 61.94 | 71.52 | 16% | 7.683.891 | 8.891.671 | 1.207.780 | 16% |
| | | Car 4 | 442.185 | 442.185 | 0% | 43.94 | 43.68 | 0% | 19.384.914 | 19.376.439 | -8.475 | 0% |
| | | Car 5 | 66.057 | 66.057 | 0% | 18.58 | 43.68 | 135% | 1.227.381 | 2.085.636 | 1.658.255 | 135% |
| | Gasoline total | 794.688 | 794.688 | 0% | 92.69 | 81.65 | -11% | 73.165.851 | 64.851.591 | -8.333.906 | -11% | |
| | Diesel Oil | pre-Cars | 1.711 | 1.711 | 0% | 318.18 | 264.95 | -17% | 583.760 | 453.187 | -130.566 | -15% |
| | | Car 1 | 8.426 | 8.426 | 0% | 267.32 | 246.66 | -11% | 2.585.115 | 2.239.987 | -345.128 | -11% |
| | | Car 2 | 42.514 | 42.514 | 0% | 407.93 | 279.27 | -40% | 17.384.549 | 9.921.916 | -7.462.633 | -43% |
| | | Car 3 | 121.429 | 121.429 | 0% | 555.36 | 176.55 | -68% | 67.437.053 | 21.681.386 | -45.755.667 | -68% |
| | | Car 4 | 264.943 | 264.943 | 0% | 388.88 | 143.48 | -63% | 102.817.881 | 38.089.755 | -64.728.126 | -63% |
| | | Car 5 | 113.047 | 113.047 | 0% | 435.12 | 143.48 | -67% | 49.536.960 | 16.332.974 | -33.203.986 | -67% |
| | Diesel oil total | 685 | 685 | 0% | 259.59 | 143.48 | -45% | 180.582 | 99.754 | -80.828 | -45% | |
| | LDVs Total | 553.564 | 553.564 | 0% | 434.12 | 159.92 | -63% | 249.713.791 | 88.138.959 | -161.574.832 | -63% | |
| Pkx Total | 1.348.252 | 1.348.252 | 0% | 232.52 | 133.47 | -43% | 713.899.642 | 559.990.596 | -153.909.046 | -22% | | |
| 1.A.3.a.ii. Light Duty Vehicles (LDV) | Gasoline | pre-Cars | 1.084 | 1.084 | 0% | 626.75 | 645.95 | 3% | 682.074 | 780.373 | 98.299 | 15% |
| | | Car 1 | 283 | 283 | 0% | 818.74 | 584.47 | -29% | 243.289 | 86.158 | -157.132 | -65% |
| | | Car 2 | 1.184 | 1.184 | 0% | 268.66 | 191.66 | -29% | 310.529 | 223.189 | -87.340 | -28% |
| | | Car 3 | 783 | 783 | 0% | 85.97 | 35.39 | -59% | 67.320 | 74.782 | 7.462 | 11% |
| | | Car 4 | 2.562 | 2.562 | 0% | 37.38 | 46.51 | 24% | 95.786 | 119.162 | 23.376 | 24% |
| | | Car 5 | 241 | 241 | 0% | 16.13 | 46.51 | 189% | 3.882 | 11.190 | 7.308 | 189% |
| | Gasoline total | 6.118 | 6.118 | 0% | 229.35 | 186.57 | -18% | 1.483.081 | 1.254.776 | -228.305 | -15% | |
| | Diesel Oil | pre-Cars | 3.995 | 3.995 | 0% | 425.99 | 386.79 | -9% | 1.989.280 | 1.225.682 | -763.598 | -38% |
| | | Car 1 | 4.787 | 4.787 | 0% | 398.71 | 276.24 | -30% | 1.984.260 | 1.030.426 | -953.834 | -48% |
| | | Car 2 | 10.816 | 10.816 | 0% | 336.90 | 153.18 | -54% | 3.644.582 | 2.091.063 | -1.553.519 | -43% |
| | | Car 3 | 28.876 | 28.876 | 0% | 541.53 | 150.54 | -72% | 15.037.249 | 4.345.870 | -10.691.379 | -72% |
| | | Car 4 | 60.0 | 60.0 | 0% | 469.82 | 89.29 | -81% | 39.029.914 | 5.429.816 | -33.600.098 | -86% |
| | | Car 5 | 6.009 | 6.009 | 0% | 440.85 | 89.26 | -80% | 2.930.190 | 584.364 | -2.345.826 | -80% |
| | Diesel oil total | 115.967 | 115.967 | 0% | 195.21 | 89.26 | -54% | 16 | 6 | -6 | -43% | |
| | LDVs Total | 122.085 | 122.085 | 0% | 405.55 | 126.92 | -74% | 55.844.558 | 15.708.142 | -40.136.416 | -74% | |
| 1.A.3.a.iii. Heavy Duty Vehicles (HDV) | Diesel Oil | pre-Cars | 2.620 | 2.620 | 0% | 902.89 | 1019.78 | 12% | 2.835.189 | 2.671.331 | -164.778 | -6% |
| | | Car 1 | 2.258 | 2.258 | 0% | 750.61 | 713.48 | -5% | 1.699.781 | 1.636.297 | -63.484 | -4% |
| | | Car 2 | 9.074 | 9.074 | 0% | 804.17 | 645.36 | -20% | 7.129.125 | 5.557.659 | -1.571.466 | -22% |
| | | Car 3 | 16.887 | 16.887 | 0% | 823.96 | 417.28 | -49% | 14.681.880 | 6.889.054 | -7.802.827 | -54% |
| | | Car 4 | 5.131 | 5.131 | 0% | 448.86 | 361.81 | -20% | 2.363.330 | 1.681.274 | -680.056 | -29% |
| | | Car 5 | 13.396 | 13.396 | 0% | 336.60 | 182.62 | -46% | 4.589.052 | 2.486.399 | -2.092.653 | -46% |
| | Diesel Oil total | 47.365 | 47.365 | 0% | 592.65 | 448.99 | -24% | 28.071.271 | 21.286.323 | -6.884.948 | -24% | |
| | Buses Total | 8.044 | 8.044 | 0% | 1.030.67 | 783.88 | -25% | 8.355.423 | 6.144.933 | -2.210.491 | -26% | |
| | Car 1 | 4.384 | 4.384 | 0% | 758.16 | 574.04 | -23% | 3.288.422 | 2.536.377 | -752.044 | -23% | |
| | Car 2 | 29.277 | 29.277 | 0% | 817.37 | 550.61 | -33% | 23.947.723 | 15.233.223 | -8.714.499 | -36% | |
| | Car 3 | 121.581 | 121.581 | 0% | 538.56 | 272.69 | -49% | 117.521.620 | 45.352.437 | -72.169.183 | -41% | |
| | Car 4 | 68.430 | 68.430 | 0% | 395.26 | 289.43 | -26% | 32.977.784 | 15.969.685 | -16.998.099 | -52% | |
| | Car 5 | 342.751 | 342.751 | 0% | 278.30 | 162.05 | -41% | 96.589.479 | 52.019.687 | -44.569.792 | -45% | |
| | Diesel Oil total | 363.891 | 363.891 | 0% | 418.38 | 244.97 | -40% | 219.470.121 | 136.136.342 | -83.333.779 | -38% | |
| | Trucks Total | 7.389 | 7.389 | 0% | 122.96 | 150.24 | 22% | 969.588 | 1.110.170 | 201.582 | 22% | |
| Car 1 | 4.085 | 4.085 | 0% | 134.72 | 108.26 | -20% | 599.299 | 889.547 | 290.248 | 49% | | |
| Car 2 | 3.544 | 3.544 | 0% | 137.85 | 134.58 | -4% | 488.552 | 688.693 | 201.851 | 41% | | |
| Car 3 | 3.560 | 3.560 | 0% | 39.59 | 19.68 | -50% | 160.553 | 680.834 | 520.280 | 324% | | |
| Car 4 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | | |
| Car 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | | |
| MGVs Total | 19.289 | 19.289 | 0% | 119.78 | 171.64 | 54% | 217.082 | 3.299.162 | 1.162.180 | 54% | | |
| 1.A.3.b. Road Transport | Total | 2.160.883 | 2.160.883 | 0% | 305.90 | 157.85 | -49% | 632.365.736 | 321.625.655 | -310.740.081 | -49% | |

| Adjustment details for 2023 | | | | | | | | | | | | |
|---------------------------------------|------------|-------------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|-------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [kg] | in [kg] | in [kg] | in [%] | |
| 1.A.3.a.i. Passenger Cars | Gasoline | pre-Euro | 11,581 | 11,581 | 0% | 607.72 | 635.38 | -52% | 7,035,041 | 6,189,785 | -836,256 | -52% |
| | | Euro 1 | 47,487 | 47,487 | 0% | 348.56 | 341.62 | -31% | 16,571,746 | 11,426,129 | -5,145,617 | -31% |
| | | Euro 2 | 72,781 | 72,781 | 0% | 194.27 | 137.92 | -29% | 13,487,749 | 10,035,380 | -3,372,369 | -26% |
| | | 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 | 790,267 | 790,267 | 0% | 85.73 | 78.88 | -8% | 64,379,964 | 58,577,229 | -5,802,735 | -9% |
| | Diesel Oil | pre-Euro | 1,447 | 1,447 | 0% | 311.98 | 284.96 | -9% | 463,963 | 383,872 | -80,091 | -9% |
| | | Euro 1 | 6,660 | 6,660 | 0% | 267.79 | 246.44 | -11% | 1,980,264 | 1,721,787 | -258,477 | -11% |
| | | Euro 2 | 33,967 | 33,967 | 0% | 406.82 | 279.27 | -40% | 13,987,432 | 7,445,646 | -6,541,787 | -40% |
| | | Euro 3 | 183,539 | 183,539 | 0% | 564.82 | 176.63 | -69% | 58,389,037 | 18,434,837 | -39,954,200 | -69% |
| | | Euro 4 | 234,943 | 234,943 | 0% | 398.41 | 146.46 | -62% | 91,724,190 | 34,488,997 | -57,235,193 | -62% |
| | | 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% | 259.84 | 146.46 | -44% | 484,664 | 220,086 | -264,578 | -44% |
| | | Diesel oil total | 555,245 | 555,245 | 0% | 415.96 | 158.66 | -64% | 242,962,982 | 88,096,639 | -154,866,343 | -64% |
| | | PKs Total | 1,345,512 | 1,345,512 | 0% | 234.61 | 115.29 | -50% | 386,442,896 | 146,673,867 | -239,769,029 | -50% |
| | Gasoline | pre-Euro | 962 | 962 | 0% | 632.36 | 645.95 | 2% | 607,179 | 621,166 | 13,987 | 2% |
| | | Euro 1 | 232 | 232 | 0% | 803.24 | 193.22 | -76% | 189,985 | 70,295 | -119,690 | -61% |
| | | Euro 2 | 989 | 989 | 0% | 271.16 | 195.74 | -28% | 269,134 | 133,538 | -135,596 | -28% |
| | | Euro 3 | 835 | 835 | 0% | 89.38 | 98.33 | 10% | 74,623 | 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% | 15.37 | 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 | 1,022,093 | -346,661 | -9% |
| | | Euro 1 | 3,666 | 3,666 | 0% | 399.34 | 276.24 | -30% | 1,445,960 | 1,017,634 | -428,326 | -30% |
| | | Euro 2 | 8,479 | 8,479 | 0% | 336.46 | 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 | 3,565,082 | -9,485,199 | -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% | 7,040,461 | 1,420,906 | -5,619,555 | -80% |
| | | Euro 6 | 1 | 1 | 0% | 15.14 | 89.85 | -81% | 122 | 72 | -50 | -41% |
| | | Diesel oil total | 114,550 | 114,550 | 0% | 485.91 | 126.17 | -79% | 55,186,382 | 13,741,354 | -41,445,028 | -79% |
| | | LDVs Total | 129,088 | 129,088 | 0% | 489.51 | 123.61 | -74% | 56,344,903 | 14,834,656 | -41,510,247 | -74% |
| 1.A.3.b.ii. Heavy Duty Vehicles Buses | Gasoline | pre-Euro | 1,326 | 1,326 | 0% | 1091.46 | 1919.46 | 4% | 1,410,640 | 1,352,283 | -58,357 | -4% |
| | | Euro 1 | 1,246 | 1,246 | 0% | 727.34 | 731.15 | 1% | 1,017,476 | 1,017,184 | -292 | -1% |
| | | Euro 2 | 7,789 | 7,789 | 0% | 703.46 | 643.34 | -9% | 5,085,091 | 4,597,478 | -487,613 | -9% |
| | | Euro 3 | 14,483 | 14,483 | 0% | 629.94 | 457.61 | -27% | 9,073,137 | 6,089,744 | -2,983,393 | -27% |
| | | Euro 4 | 5,331 | 5,331 | 0% | 468.16 | 361.86 | -23% | 2,642,179 | 1,675,777 | -966,402 | -23% |
| | | Euro 5 | 20,752 | 20,752 | 0% | 347.84 | 182.99 | -47% | 7,219,563 | 3,787,467 | -3,432,096 | -47% |
| | | Euro 6 | 73 | 73 | 0% | 64.52 | 182.99 | 236% | 3,961 | 13,296 | 9,334 | 236% |
| | | Buses Total | 50,962 | 50,962 | 0% | 533.22 | 384.33 | -28% | 27,141,913 | 19,965,288 | -7,176,625 | -28% |
| | Diesel Oil | pre-Euro | 6,922 | 6,922 | 0% | 1036.95 | 158.82 | -21% | 7,107,543 | 5,252,345 | -1,855,198 | -21% |
| | | Euro 1 | 3,630 | 3,630 | 0% | 743.70 | 570.57 | -24% | 2,721,326 | 2,071,111 | -650,215 | -24% |
| | | Euro 2 | 23,577 | 23,577 | 0% | 818.27 | 516.43 | -37% | 19,262,253 | 12,175,855 | -7,086,398 | -37% |
| | | Euro 3 | 96,736 | 96,736 | 0% | 634.65 | 270.21 | -42% | 61,387,137 | 35,888,665 | -25,498,472 | -42% |
| | | Euro 4 | 60,550 | 60,550 | 0% | 366.50 | 288.44 | -21% | 19,962,680 | 14,680,877 | -5,281,723 | -27% |
| | | Euro 5 | 485,981 | 485,981 | 0% | 261.24 | 152.32 | -42% | 116,149,955 | 61,626,577 | -54,523,378 | -42% |
| | | Euro 6 | 2,380 | 2,380 | 0% | 188.487 | 360.323 | 191% | 448,487 | 1,603,323 | 1,154,836 | 257% |
| | | Trucks Total | 589,585 | 589,585 | 0% | 385.33 | 224.69 | -41% | 224,829,180 | 132,064,153 | -92,765,027 | -41% |
| | Gasoline | pre-Euro | 6,190 | 6,190 | 0% | 122.76 | 151.03 | 23% | 822,539 | 1,011,920 | 189,381 | 23% |
| | | Euro 1 | 4,386 | 4,386 | 0% | 124.61 | 171.39 | 39% | 536,615 | 738,050 | 201,435 | 39% |
| | | Euro 2 | 3,267 | 3,267 | 0% | 136.22 | 184.56 | 45% | 445,087 | 636,853 | 191,766 | 43% |
| | | Euro 3 | 3,984 | 3,984 | 0% | 38.66 | 184.56 | 382% | 138,386 | 778,616 | 640,230 | 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% |
| | | MDVs Total | 18,268 | 18,268 | 0% | 107.43 | 175.28 | 61% | 1,982,548 | 3,165,439 | 1,182,891 | 61% |
| | | 1.A.3.b. Road Transport | 2,084,964 | 2,084,964 | 0% | 295.79 | 151.71 | -49% | 616,721,438 | 396,381,343 | -220,340,094 | -49% |

| Adjustment details for 2023 | | | | | | | | | | | | |
|---|------------------|-------------------|--------------------|----------------------|-------------------------|----------------------|----------------------|---------------------------|---------------------|-----------------------|----------------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current in [t] | adjusted in [t] | difference in [%] | current in [g/t] | adjusted in [g/t] | difference in [%] | current in [kg] | adjusted in [kg] | adjustment in [kg] | difference in [%] | |
| 1.A.3.a.i. Passenger Cars | Gasoline | pre-Euro | 11,680 | 11,680 | 0% | 619.27 | 649.35 | -5% | 7,011,641 | 6,967,452 | -4,448 | -5% |
| | | Euro 1 | 37,743 | 37,743 | 0% | 353.78 | 261.98 | -32% | 13,362,966 | 9,129,436 | -4,233,530 | -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 | 675,302 | 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% |
| | Gasoline total | 749,156 | 749,156 | 0% | 88.35 | 74.85 | -7% | 69,190,687 | 56,671,737 | -12,518,950 | -18% | |
| | Diesel Oil | pre-Euro | 1,389 | 1,389 | 0% | 312.32 | 264.96 | -15% | 433,081 | 368,139 | -64,942 | -15% |
| | | Euro 1 | 5,426 | 5,426 | 0% | 298.42 | 246.79 | -17% | 1,678,472 | 1,340,688 | -337,784 | -17% |
| | | Euro 2 | 28,437 | 28,437 | 0% | 406.84 | 279.91 | -40% | 11,963,522 | 6,253,531 | -5,709,991 | -40% |
| | | Euro 3 | 92,795 | 92,795 | 0% | 574.33 | 176.67 | -69% | 53,284,956 | 18,579,373 | -34,705,583 | -69% |
| | | Euro 4 | 222,583 | 222,583 | 0% | 393.55 | 149.27 | -62% | 87,598,471 | 33,225,566 | -54,372,905 | -62% |
| | | Euro 5 | 233,766 | 233,766 | 0% | 435.42 | 149.27 | -66% | 101,787,275 | 34,894,768 | -66,892,507 | -66% |
| | Diesel oil total | 589,131 | 589,131 | 0% | 437.54 | 158.71 | -64% | 257,533,128 | 83,695,606 | -173,837,522 | -64% | |
| PKs Total | 1,338,287 | 1,338,287 | 0% | 237.40 | 111.77 | -53% | 317,723,735 | 146,570,886 | -171,152,849 | -53% | | |
| Gasoline | pre-Euro | 981 | 981 | 0% | 633.81 | 645.95 | 2% | 1,048,320 | 1,075,293 | 26,973 | 2% | |
| | Euro 1 | 194 | 194 | 0% | 803.50 | 193.22 | -76% | 187,281 | 59,328 | -127,953 | -68% | |
| | Euro 2 | 836 | 836 | 0% | 274.42 | 281.18 | 21% | 229,520 | 189,285 | -41,235 | -27% | |
| | Euro 3 | 784 | 784 | 0% | 52.66 | 191.79 | 10% | 72,691 | 79,780 | 7,089 | 10% | |
| | Euro 4 | 1,089 | 1,089 | 0% | 43.70 | 48.89 | 10% | 77,284 | 82,833 | 5,549 | 20% | |
| | Euro 5 | 965 | 965 | 0% | 16.67 | 48.89 | 183% | 16,187 | 47,268 | 31,081 | 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 | 1,096,727 | -40,572 | -3% | |
| Diesel Oil | pre-Euro | 2,744 | 2,744 | 0% | 424.37 | 386.79 | -9% | 1,168,757 | 944,928 | -223,829 | -20% | |
| | Euro 1 | 2,945 | 2,945 | 0% | 399.75 | 276.24 | -30% | 1,166,782 | 834,566 | -332,216 | -29% | |
| | Euro 2 | 6,982 | 6,982 | 0% | 336.92 | 133.39 | -42% | 2,340,147 | 1,350,674 | -989,473 | -42% | |
| | Euro 3 | 20,421 | 20,421 | 0% | 568.12 | 180.46 | -68% | 6,427,566 | 2,050,015 | -4,377,551 | -68% | |
| | Euro 4 | 55,887 | 55,887 | 0% | 497.72 | 160.46 | -68% | 16,187,275 | 5,046,426 | -11,140,849 | -68% | |
| | Euro 5 | 29,024 | 29,024 | 0% | 141.97 | 160.46 | 10% | 11,963,522 | 2,087,564 | -9,875,958 | -83% | |
| | Euro 6 | 41 | 41 | 0% | 105.30 | 160.46 | 49% | 6,160 | 2,688 | -3,472 | -60% | |
| | Diesel oil total | 118,777 | 118,777 | 0% | 488.66 | 174.90 | -76% | 57,083,533 | 13,656,480 | -43,427,053 | -76% | |
| LDNs Total | 124,354 | 124,354 | 0% | 488.14 | 180.63 | -79% | 58,214,142 | 14,677,275 | -43,536,867 | -79% | | |
| 1.A.3.a.ii. Heavy Duty Vehicles (HDV) | pre-Euro | 1,152 | 1,152 | 0% | 1066.68 | 1019.23 | -5% | 1,249,028 | 1,154,143 | -94,885 | -8% | |
| | Euro 1 | 1,064 | 1,064 | 0% | 727.68 | 700.98 | -4% | 786,620 | 731,181 | -55,439 | -7% | |
| | Euro 2 | 6,984 | 6,984 | 0% | 754.01 | 661.48 | -10% | 2,578,084 | 4,376,271 | 1,798,187 | 10% | |
| | Euro 3 | 13,187 | 13,187 | 0% | 826.43 | 477.63 | -42% | 8,862,880 | 5,986,228 | -2,876,652 | -33% | |
| | Euro 4 | 6,946 | 6,946 | 0% | 863.55 | 343.71 | -54% | 2,330,961 | 1,779,796 | -551,165 | -24% | |
| | Euro 5 | 26,096 | 26,096 | 0% | 358.88 | 183.48 | -49% | 8,835,653 | 4,420,743 | -4,414,910 | -50% | |
| | Euro 6 | 537 | 537 | 0% | 44.76 | 183.48 | 310% | 30,407 | 86,572 | 56,165 | 180% | |
| | Buses Total | 51,736 | 51,736 | 0% | 509.54 | 306.06 | -40% | 26,390,989 | 18,620,843 | -7,770,146 | -29% | |
| 1.A.3.a.iii. Heavy Duty Trucks & Trailers | pre-Euro | 5,083 | 5,083 | 0% | 1039.72 | 737.35 | -29% | 6,072,170 | 4,322,880 | -1,749,290 | -29% | |
| | Euro 1 | 2,945 | 2,945 | 0% | 743.27 | 585.47 | -21% | 2,176,946 | 1,690,969 | -485,977 | -23% | |
| | Euro 2 | 19,446 | 19,446 | 0% | 818.17 | 510.25 | -37% | 15,089,881 | 9,449,975 | -5,639,906 | -37% | |
| | Euro 3 | 76,130 | 76,130 | 0% | 838.63 | 447.63 | -46% | 62,817,447 | 27,588,228 | -35,229,219 | -43% | |
| | Euro 4 | 42,781 | 42,781 | 0% | 396.90 | 287.27 | -27% | 16,936,867 | 12,280,770 | -4,656,097 | -27% | |
| | Euro 5 | 436,960 | 436,960 | 0% | 267.70 | 152.65 | -43% | 129,151,324 | 66,796,246 | -62,355,078 | -43% | |
| | Euro 6 | 18,020 | 18,020 | 0% | 58.67 | 152.65 | 261% | 917,082 | 2,750,630 | 1,833,548 | 201% | |
| | Trucks Total | 680,139 | 680,139 | 0% | 353.86 | 287.50 | -21% | 211,887,331 | 124,180,189 | -87,697,142 | -41% | |
| 1.A.3.b.iii. Motorised Two-Wheelers (M2W) | pre-Euro | 6,362 | 6,362 | 0% | 123.07 | 111.79 | -9% | 781,736 | 664,179 | -117,557 | -15% | |
| | Euro 1 | 4,013 | 4,013 | 0% | 125.11 | 173.15 | 39% | 502,073 | 634,880 | 132,807 | 30% | |
| | Euro 2 | 3,362 | 3,362 | 0% | 132.24 | 185.58 | 40% | 436,668 | 645,894 | 209,226 | 48% | |
| | Euro 3 | 4,562 | 4,562 | 0% | 39.81 | 185.58 | 381% | 181,610 | 802,175 | 620,565 | 343% | |
| | Euro 4 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | |
| | Euro 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | |
| M2Ws Total | 18,229 | 18,229 | 0% | 104.34 | 175.38 | 68% | 1,962,088 | 3,187,638 | 1,294,951 | 66% | | |
| 1.A.3.b. Road Transport | Total | 2,132,683 | 2,132,683 | 0% | 268.88 | 147.76 | -50% | 616,079,063 | 390,854,731 | -225,224,332 | -38% | |

| 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 | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [kg] | in [kg] | in [kg] | in [%] | |
| 1.A.3.b.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 | -6.521 | 11.082.246 | 7.480.641 | -3.621.706 | -32% |
| | | Car 2 | 53.486 | 53.486 | 0% | 196.58 | 140.31 | -29% | 10.514.477 | 7.584.432 | -3.018.844 | -29% |
| | | Car 3 | 87.374 | 87.374 | 0% | 65.31 | 73.93 | 7% | 6.955.589 | 6.459.797 | -494.218 | -7% |
| | | Car 4 | 387.759 | 387.759 | 0% | 45.16 | 47.80 | -3% | 19.093.585 | 16.536.099 | -2.527.557 | -13% |
| | | Car 5 | 171.270 | 171.270 | 0% | 16.59 | 47.80 | 151% | 3.183.282 | 0.187.581 | -5.004.299 | 151% |
| | Car 6 | 10.315 | 10.315 | 0% | 25.97 | 47.80 | 84% | 267.855 | 433.096 | 225.246 | 84% | |
| | Gasoline total | 752.526 | 752.526 | 0% | 76.60 | 73.89 | -4% | 57.215.533 | 54.988.501 | -2,216,412 | -4% | |
| | Diesel Oil | pre-Cars | 1.341 | 1.341 | 0% | 311.73 | 284.66 | -9% | 417.947 | 366.246 | -42.722 | -10% |
| | | Car 1 | 4.992 | 4.992 | 0% | 298.92 | 267.29 | -11% | 1.482.284 | 1.387.643 | -156.951 | -11% |
| | | Car 2 | 23.934 | 23.934 | 0% | 406.71 | 320.45 | -20% | 9.734.484 | 5.276.490 | -4.458.094 | -46% |
| | | Car 3 | 82.749 | 82.749 | 0% | 585.53 | 176.81 | -69% | 48.451.830 | 14.796.245 | -33.655.585 | -69% |
| | | Car 4 | 211.237 | 211.237 | 0% | 297.27 | 151.77 | -42% | 120.917.680 | 32.059.973 | -88.857.706 | -62% |
| | | Car 5 | 285.011 | 285.011 | 0% | 436.38 | 151.77 | -65% | 124.721.396 | 43.370.300 | -81.343.896 | -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 | 99.613.892 | -173,262,169 | -62% | | |
| Pkcs Total | 1,338,571 | 1,338,571 | 0% | 298.44 | 152.15 | -53% | 138,091,584 | 154,652,853 | -175,478,261 | -53% | | |
| 1.A.3.b.ii. - Light Duty Vehicles (LDVs) | Gasoline | pre-Cars | 986 | 986 | 0% | 632.44 | 645.95 | 2% | 1,603,683 | 1,776.724 | 173.041 | 11% |
| | | Car 1 | 173 | 173 | 0% | 968.27 | 989.96 | 64% | 150.074 | 53.575 | -96.499 | -64% |
| | | Car 2 | 748 | 748 | 0% | 204.73 | 287.11 | 21% | 212.888 | 154.839 | -58.029 | -27% |
| | | Car 3 | 771 | 771 | 0% | 98.62 | 185.21 | 7% | 75.982 | 81.070 | 5.078 | 7% |
| | | Car 4 | 1.087 | 1.087 | 0% | 43.47 | 50.15 | 15% | 81.139 | 83.618 | 2.479 | 3% |
| | | Car 5 | 1.374 | 1.374 | 0% | 17.11 | 50.15 | 183% | 23.517 | 68.918 | 45.401 | 183% |
| | Car 6 | 17 | 17 | 0% | 18.06 | 50.15 | 179% | 212 | 670 | 657 | 179% | |
| | Gasoline total | 5.845 | 5.845 | 0% | 596.34 | 176.49 | -7% | 1,112,584 | 1,631,652 | 288,972 | 26% | |
| | Diesel Oil | pre-Cars | 2.537 | 2.537 | 0% | 428.16 | 386.79 | -21% | 1,985.919 | 1,776.259 | -207.559 | -11% |
| | | Car 1 | 2.588 | 2.588 | 0% | 393.82 | 276.25 | -30% | 987.136 | 639.898 | -347.328 | -33% |
| | | Car 2 | 6.087 | 6.087 | 0% | 338.91 | 133.25 | -42% | 1,385.995 | 1,180.889 | -428.126 | -30% |
| | | Car 3 | 18.220 | 18.220 | 0% | 571.75 | 150.58 | -74% | 10,417.076 | 2,742.056 | -7,675.020 | -74% |
| | | Car 4 | 52.361 | 52.361 | 0% | 498.70 | 91.69 | -82% | 26,164.486 | 4,703.746 | -21,394.748 | -82% |
| | | Car 5 | 46.749 | 46.749 | 0% | 438.64 | 91.69 | -79% | 20,696.234 | 4,258.626 | -16,237.709 | -79% |
| Car 6 | 187 | 187 | 0% | 151.18 | 91.69 | -40% | 29.829 | 17.974 | -11.855 | -40% | | |
| Diesel oil total | 128,528 | 128,528 | 0% | 415.56 | 170.96 | -77% | 61,146,575 | 14,267,237 | -46,879,338 | -77% | | |
| LDVs Total | 134,423 | 134,423 | 0% | 463.56 | 153.81 | -75% | 62,299,160 | 15,298,849 | -46,988,311 | -75% | | |
| 1.A.3.b.iii. - Heavy Duty Vehicle Buses | Gasoline | pre-Cars | 984 | 984 | 0% | 1099.48 | 1919.23 | -5% | 1,062,384 | 1,062,921 | -48,443 | -5% |
| | | Car 1 | 837 | 837 | 0% | 728.12 | 130.98 | -3% | 689.232 | 628.359 | -18.127 | -3% |
| | | Car 2 | 5.586 | 5.586 | 0% | 704.95 | 643.67 | -9% | 4,284.320 | 3,683.441 | -798.857 | -19% |
| | | Car 3 | 11.221 | 11.221 | 0% | 621.20 | 458.38 | -27% | 7,082.740 | 5,143.628 | -1,939.228 | -27% |
| | | Car 4 | 4.270 | 4.270 | 0% | 461.10 | 361.79 | -24% | 1,972.610 | 1,584.978 | -467.632 | -24% |
| | | Car 5 | 22.042 | 22.042 | 0% | 368.55 | 183.99 | -49% | 7,726.921 | 4,065.632 | -3,671.389 | -49% |
| | 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 | -6,208,881 | -27% | |
| | Diesel Oil | pre-Cars | 4.182 | 4.182 | 0% | 1034.34 | 737.35 | -29% | 4,945.942 | 3,525.898 | -1,420.134 | -29% |
| | | Car 1 | 2.285 | 2.285 | 0% | 748.66 | 561.41 | -25% | 1,600.685 | 1,237.759 | -362.948 | -23% |
| | | Car 2 | 13.623 | 13.623 | 0% | 817.90 | 510.38 | -38% | 11,446.867 | 6,565.736 | -4,891.131 | -38% |
| | | Car 3 | 54.685 | 54.685 | 0% | 632.52 | 364.41 | -42% | 36,589.677 | 19,927.835 | -16,661.841 | -42% |
| | | Car 4 | 34.037 | 34.037 | 0% | 396.37 | 285.34 | -30% | 13,481.158 | 9,711.896 | -3,779.262 | -28% |
| | | Car 5 | 389.263 | 389.263 | 0% | 282.92 | 153.66 | -46% | 110,112.782 | 59,688.643 | -50,424.149 | -46% |
| Car 6 | 34.214 | 34.214 | 0% | 63.96 | 153.66 | 189% | 3,937.089 | 11,368.562 | 7,421.413 | 189% | | |
| Trucks Total | 572,754 | 572,754 | 0% | 314.85 | 196.65 | -38% | 179,874,133 | 112,285,562 | -67,588,571 | -38% | | |
| 1.A.3.b.iv. - Motorised Two-Wheelers (MOWs) | Gasoline | pre-Cars | 6.185 | 6.185 | 0% | 122.85 | 158.64 | 29% | 795.185 | 974.388 | 218.182 | 29% |
| | | Car 1 | 3.037 | 3.037 | 0% | 124.71 | 174.84 | 40% | 478.514 | 670.859 | 192.346 | 40% |
| | | Car 2 | 3.365 | 3.365 | 0% | 128.94 | 186.25 | 52% | 433.874 | 680.370 | 226.504 | 52% |
| | | Car 3 | 5.385 | 5.385 | 0% | 38.53 | 186.25 | 380% | 299.722 | 1,041.189 | 821.467 | 380% |
| | | 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 | 179.24 | 78% | 1,878,294 | 3,386,794 | 1,488,499 | 78% | | |
| 1.A.3.b. Road Transport | Total | 2.153.563 | 2.153.563 | 0% | 277.27 | 140.35 | -49% | 597.120.297 | 362.252.271 | -234.868.025 | -49% | |

| Adjustment details for 2026 | | | | | | | | | | | | |
|---|------------|------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|--------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [t] | in [t] | in [t] | in [t] | |
| 1.A.3.b.i - Passenger Cars | Gasoline | pre-Euro | 15 782 | 15 782 | 0% | 634.75 | 644.11 | -14% | 7 470 914 | 6 410 967 | -1 059 947 | -14% |
| | | Euro 1 | 39 270 | 39 270 | 0% | 372.25 | 341.68 | -8% | 7 545 483 | 4 886 888 | -2 658 595 | -35% |
| | | Euro 2 | 36 062 | 36 062 | 0% | 212.73 | 143.11 | -33% | 7 671 581 | 5 180 897 | -2 490 684 | -33% |
| | | Euro 3 | 83 039 | 83 039 | 0% | 76.17 | 75.50 | -1% | 4 881 482 | 4 759 259 | -122 223 | -1% |
| | | Euro 4 | 334 413 | 334 413 | 0% | 53.74 | 50.17 | -7% | 17 363 364 | 16 777 445 | -585 919 | -3% |
| | | Euro 5 | 183 374 | 183 374 | 0% | 19.09 | 50.17 | 163% | 3 580 745 | 9 189 834 | 5 609 089 | 163% |
| | Diesel Oil | Euro 6 | 65 332 | 65 332 | 0% | 25.67 | 50.17 | 89% | 1 768 917 | 3 327 855 | 1 558 938 | 88% |
| | | Gasoline total | 715 272 | 715 272 | 0% | 79.93 | 70.65 | -11% | 58 736 267 | 50 535 049 | -8 201 218 | -14% |
| | | pre-Euro | 1 380 | 1 380 | 0% | 369.76 | 254.56 | -31% | 366 262 | 239 173 | -127 089 | -34% |
| | | Euro 1 | 3 749 | 3 749 | 0% | 298.36 | 269.66 | -9% | 1 122 449 | 1 011 626 | -110 823 | -10% |
| | | Euro 2 | 16 584 | 16 584 | 0% | 407.19 | 221.43 | -46% | 6 720 132 | 3 663 964 | -3 056 168 | -46% |
| | | Euro 3 | 81 398 | 81 398 | 0% | 802.50 | 179.24 | -78% | 36 981 999 | 11 085 409 | -25 896 590 | -70% |
| | Diesel Oil | Euro 4 | 175 040 | 175 040 | 0% | 405.76 | 156.24 | -61% | 71 362 220 | 27 474 086 | -43 888 134 | -61% |
| | | Euro 5 | 299 054 | 299 054 | 0% | 433.34 | 156.24 | -64% | 130 032 044 | 46 019 229 | -83 912 815 | -64% |
| | | Euro 6 | 116 034 | 116 034 | 0% | 268.75 | 156.24 | -41% | 30 427 555 | 10 232 785 | -19 194 770 | -63% |
| | | Diesel oil total | 625 119 | 625 119 | 0% | 418.36 | 160.76 | -61% | 277 941 660 | 108 535 230 | -169 406 430 | -61% |
| | | Pkx Total | 1 384 391 | 1 384 391 | 0% | 235.75 | 154.41 | -51% | 327 778 627 | 159 070 280 | -168 708 347 | -51% |
| 1.A.3.b.ii - Light Duty Vehicles (LDV) | Gasoline | pre-Euro | 910 | 910 | 0% | 602.79 | 645.95 | -7% | 593 186 | 547 543 | -45 643 | -8% |
| | | Euro 1 | 136 | 136 | 0% | 908.31 | 312.78 | -66% | 122 126 | 42 425 | -79 701 | -65% |
| | | Euro 2 | 540 | 540 | 0% | 308.39 | 217.84 | -29% | 162 311 | 117 737 | -44 574 | -27% |
| | | Euro 3 | 650 | 650 | 0% | 108.43 | 111.57 | -3% | 70 432 | 72 731 | 2 299 | 3% |
| | | Euro 4 | 1 684 | 1 684 | 0% | 43.06 | 52.36 | 21% | 78 714 | 84 003 | 5 289 | 7% |
| | | Euro 5 | 1 724 | 1 724 | 0% | 19.82 | 52.36 | 164% | 34 157 | 80 258 | 46 101 | 164% |
| | Diesel Oil | Euro 6 | 363 | 363 | 0% | 19.85 | 52.36 | 181% | 6 764 | 19 992 | 13 228 | 181% |
| | | Gasoline total | 5 506 | 5 506 | 0% | 388.27 | 171.66 | -56% | 1 068 292 | 1 013 678 | -54 614 | -5% |
| | | pre-Euro | 2 189 | 2 189 | 0% | 414.81 | 386.79 | -7% | 899 549 | 846 433 | -53 116 | -6% |
| | | Euro 1 | 1 790 | 1 790 | 0% | 391.89 | 276.25 | -29% | 780 189 | 385 371 | -394 818 | -50% |
| | | Euro 2 | 4 223 | 4 223 | 0% | 323.43 | 153.31 | -53% | 1 365 594 | 676 452 | -689 142 | -50% |
| | | Euro 3 | 13 582 | 13 582 | 0% | 588.91 | 150.77 | -74% | 8 064 323 | 2 040 233 | -6 024 090 | -74% |
| | Diesel Oil | Euro 4 | 43 141 | 43 141 | 0% | 504.48 | 32.40 | -93% | 21 783 989 | 3 986 141 | -17 797 848 | -82% |
| | | Euro 5 | 74 231 | 74 231 | 0% | 434.16 | 32.40 | -92% | 32 223 283 | 6 658 780 | -25 564 503 | -79% |
| | | Euro 6 | 4 921 | 4 921 | 0% | 113.49 | 32.40 | -72% | 755 285 | 454 676 | -300 609 | -40% |
| | | Diesel oil total | 144 068 | 144 068 | 0% | 456.12 | 185.62 | -59% | 65 712 132 | 15 296 607 | -50 415 525 | -77% |
| | | LDVs Total | 149 594 | 149 594 | 0% | 445.23 | 188.29 | -58% | 66 781 625 | 16 229 684 | -50 551 941 | -76% |
| 1.A.3.b.iii - Heavy Duty Vehicles (HDV) | Diesel Oil | pre-Euro | 891 | 891 | 0% | 1070.81 | 1919.23 | -5% | 964 197 | 988 234 | 24 037 | 2% |
| | | Euro 1 | 583 | 583 | 0% | 731.36 | 732.67 | -2% | 433 675 | 446 236 | 12 561 | 3% |
| | | Euro 2 | 4 375 | 4 375 | 0% | 708.25 | 645.03 | -9% | 3 440 614 | 2 822 621 | -617 993 | -18% |
| | | Euro 3 | 10 333 | 10 333 | 0% | 632.87 | 458.91 | -27% | 6 539 364 | 4 741 827 | -1 797 536 | -27% |
| | | Euro 4 | 4 449 | 4 449 | 0% | 475.90 | 382.29 | -19% | 2 117 219 | 1 586 881 | -530 338 | -25% |
| | | Euro 5 | 34 360 | 34 360 | 0% | 366.36 | 185.22 | -49% | 8 935 974 | 4 617 617 | -4 318 357 | -49% |
| | Bees Total | Euro 6 | 9 126 | 9 126 | 0% | 62.79 | 185.22 | 195% | 573 066 | 1 680 431 | 1 107 365 | 195% |
| | | pre-Euro | 54 157 | 54 157 | 0% | 404.73 | 388.24 | -2% | 23 082 189 | 16 885 117 | -6 197 072 | -27% |
| | | Euro 1 | 3 933 | 3 933 | 0% | 1034.81 | 737.35 | -29% | 4 087 249 | 2 980 379 | -1 106 870 | -27% |
| | | Euro 2 | 1 555 | 1 555 | 0% | 748.16 | 587.92 | -21% | 1 163 482 | 789 813 | -373 669 | -32% |
| | | Euro 3 | 8 876 | 8 876 | 0% | 817.75 | 585.52 | -28% | 7 258 047 | 4 486 626 | -2 771 421 | -38% |
| | | Euro 4 | 34 167 | 34 167 | 0% | 638.91 | 588.66 | -8% | 21 553 280 | 12 251 155 | -9 302 125 | -43% |
| | Diesel Oil | Euro 5 | 34 287 | 34 287 | 0% | 396.94 | 281.86 | -29% | 9 640 384 | 6 885 621 | -2 754 763 | -29% |
| | | Euro 6 | 269 735 | 269 735 | 0% | 287.22 | 153.60 | -46% | 74 680 233 | 39 976 610 | -34 703 623 | -46% |
| | | Euro 6 | 261 480 | 261 480 | 0% | 61.77 | 153.60 | 149% | 16 149 289 | 40 244 036 | 24 094 748 | 149% |
| | | Trucks Total | 584 013 | 584 013 | 0% | 226.31 | 180.97 | -20% | 134 431 899 | 101 486 262 | -32 945 637 | -24% |
| | | pre-Euro | 5 543 | 5 543 | 0% | 125.59 | 155.78 | 24% | 696 072 | 883 289 | 187 218 | 24% |
| Gasoline | Euro 1 | 3 360 | 3 360 | 0% | 127.11 | 177.29 | 39% | 427 113 | 585 796 | 158 683 | 39% | |
| | Euro 2 | 3 375 | 3 375 | 0% | 125.94 | 187.68 | 50% | 421 961 | 687 078 | 265 117 | 63% | |
| | Euro 3 | 6 443 | 6 443 | 0% | 48.36 | 187.68 | 281% | 209 627 | 1 273 671 | 1 064 044 | 508% | |
| | Euro 4 | 65 | 65 | 0% | 17.47 | 187.68 | 1031% | 1 134 | 12 632 | 11 498 | 1031% | |
| | Euro 5 | 0 | 0 | 0% | 0 | 0 | 0% | 0 | 0 | 0 | 0% | |
| | HDVs 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 | Total | 2 267 339 | 2 267 339 | 0% | 258.89 | 137.22 | -46% | 553 799 598 | 362 981 620 | -190 817 978 | -45% | |

| Adjustment details for 2027 | | | | | | | | | | | | |
|--|--------------------------|------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|-------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | adjustment | difference | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [t] | in [t] | in [t] | in [t] | |
| 1.A.3.a.i - Passenger Cars | Gasoline | pre-Euro | 12 282 | 12 282 | 0% | 636.73 | 644.11 | -11% | 7 814 267 | 6 680 187 | -1 126 100 | -14% |
| | | Euro 1 | 17 449 | 17 449 | 0% | 372.96 | 341.68 | -8% | 6 588 311 | 4 217 644 | -2 370 667 | -36% |
| | | Euro 2 | 30 435 | 30 435 | 0% | 217.43 | 141.75 | -35% | 6 617 570 | 4 314 140 | -2 303 430 | -35% |
| | | Euro 3 | 54 271 | 54 271 | 0% | 78.48 | 76.27 | -3% | 4 254 938 | 4 139 376 | -115 562 | -3% |
| | | Euro 4 | 315 086 | 315 086 | 0% | 54.96 | 51.26 | -7% | 17 316 320 | 16 511 881 | -804 439 | -5% |
| | | Euro 5 | 180 240 | 180 240 | 0% | 19.17 | 51.26 | 167% | 3 485 382 | 9 239 815 | 5 754 433 | 167% |
| | Diesel Oil | Euro 6 | 114 791 | 114 791 | 0% | 25.65 | 51.26 | 82% | 3 063 235 | 5 884 372 | 2 821 137 | 92% |
| | | Gasoline total | 724 571 | 724 571 | 0% | 67.66 | 60.88 | -10% | 49 046 874 | 50 634 374 | 1 587 500 | 3% |
| | | pre-Euro | 1 790 | 1 790 | 0% | 364.96 | 254.56 | -31% | 489 963 | 347 626 | -142 337 | -29% |
| | | Euro 1 | 3 360 | 3 360 | 0% | 298.17 | 271.67 | -9% | 1 082 288 | 910 182 | -172 106 | -16% |
| | | Euro 2 | 13 788 | 13 788 | 0% | 407.17 | 222.43 | -45% | 5 614 130 | 3 066 393 | -2 547 736 | -45% |
| | | Euro 3 | 52 128 | 52 128 | 0% | 808.95 | 179.65 | -78% | 31 696 478 | 9 364 788 | -22 331 690 | -70% |
| | Diesel Oil | Euro 4 | 187 047 | 187 047 | 0% | 418.16 | 158.34 | -61% | 64 733 485 | 24 983 323 | -39 750 162 | -61% |
| | | Euro 5 | 283 480 | 283 480 | 0% | 423.99 | 158.34 | -63% | 120 187 695 | 44 073 190 | -76 114 505 | -63% |
| | | Euro 6 | 184 768 | 184 768 | 0% | 262.61 | 158.34 | -40% | 48 521 183 | 29 255 985 | -19 265 198 | -40% |
| | | Diesel oil total | 656 582 | 656 582 | 0% | 394.65 | 161.95 | -59% | 272 126 081 | 112 890 717 | -159 235 364 | -59% |
| | | Pkx Total | 1 421 142 | 1 421 142 | 0% | 225.98 | 155.61 | -31% | 321 152 965 | 163 445 435 | -157 707 530 | -49% |
| 1.A.3.b.i - Light Duty Vehicles (LDV) | Gasoline | pre-Euro | 940 | 940 | 0% | 611.41 | 645.95 | -7% | 612 247 | 606 978 | -5 269 | -1% |
| | | Euro 1 | 124 | 124 | 0% | 908.23 | 312.78 | -66% | 112 083 | 39 682 | -72 401 | -65% |
| | | Euro 2 | 485 | 485 | 0% | 302.12 | 221.62 | -27% | 140 344 | 102 950 | -37 394 | -27% |
| | | Euro 3 | 596 | 596 | 0% | 118.57 | 115.36 | -3% | 65 955 | 68 812 | 2 857 | 4% |
| | | Euro 4 | 1 476 | 1 476 | 0% | 50.72 | 53.38 | 5% | 74 877 | 78 816 | 3 938 | 5% |
| | | Euro 5 | 1 680 | 1 680 | 0% | 21.73 | 53.38 | 146% | 35 240 | 89 034 | 53 794 | 146% |
| | Diesel Oil | Euro 6 | 910 | 910 | 0% | 19.18 | 53.38 | 187% | 17 052 | 49 080 | 31 928 | 187% |
| | | Gasoline total | 6 186 | 6 186 | 0% | 171.55 | 167.18 | -2% | 1 058 199 | 1 034 211 | -24 988 | -2% |
| | | pre-Euro | 2 067 | 2 067 | 0% | 413.41 | 386.79 | -7% | 860 499 | 631 183 | -229 316 | -26% |
| | | Euro 1 | 1 538 | 1 538 | 0% | 398.47 | 276.25 | -30% | 680 795 | 331 158 | -349 636 | -50% |
| | Diesel Oil | Euro 2 | 3 580 | 3 580 | 0% | 321.26 | 193.64 | -40% | 1 543 793 | 887 293 | -656 500 | -42% |
| Euro 3 | | 11 054 | 11 054 | 0% | 595.30 | 150.79 | -75% | 5 240 325 | 1 791 552 | -3 448 773 | -65% | |
| Euro 4 | | 20 050 | 20 050 | 0% | 806.78 | 30.00 | -92% | 19 789 647 | 3 626 025 | -16 163 622 | -82% | |
| Euro 5 | | 75 789 | 75 789 | 0% | 432.95 | 30.00 | -93% | 32 790 566 | 2 564 565 | -29 226 001 | -79% | |
| Euro 6 | | 19 625 | 19 625 | 0% | 161.71 | 80.09 | -50% | 2 977 329 | 1 626 875 | -1 350 454 | -45% | |
| 1.A.3.b.ii - Heavy Duty Vehicles (HDV) | Diesel Oil | LDVs total | 153,284 | 153,284 | 0% | 424.66 | 181.89 | -57% | 65,083,930 | 19,925,274 | -45,158,657 | -70% |
| | | LDVs total | 199,470 | 199,470 | 0% | 414.83 | 186.35 | -54% | 86,152,129 | 26,959,427 | -59,192,702 | -69% |
| | | pre-Euro | 736 | 736 | 0% | 1073.33 | 1019.23 | -5% | 790 259 | 150 425 | -639 834 | -81% |
| | | Euro I | 411 | 411 | 0% | 731.97 | 732.57 | 0% | 300 684 | 389 062 | 88 378 | 29% |
| | | Euro II | 3 325 | 3 325 | 0% | 707.91 | 664.79 | -7% | 2 620 087 | 2 147 480 | -472 606 | -18% |
| | | Euro III | 8 678 | 8 678 | 0% | 824.33 | 419.12 | -49% | 6 457 480 | 3 984 085 | -2 473 395 | -38% |
| | Diesel Oil | Euro IV | 3 923 | 3 923 | 0% | 474.07 | 362.49 | -24% | 2 812 380 | 1 347 600 | -1 464 780 | -52% |
| | | Euro V | 21 613 | 21 613 | 0% | 363.92 | 186.49 | -49% | 7 937 975 | 4 050 686 | -3 884 291 | -49% |
| | | Euro VI | 14 586 | 14 586 | 0% | 68.52 | 186.49 | 270% | 864 215 | 2 712 580 | 1 848 365 | 214% |
| | | Buses Total | 53,382 | 53,382 | 0% | 318.80 | 286.71 | -23% | 19,193,981 | 15,384,628 | -3,809,353 | -20% |
| | | Euro I | 3 686 | 3 686 | 0% | 1034.43 | 737.15 | -29% | 3 730 272 | 2 659 076 | -1 071 196 | -29% |
| Diesel Oil | Euro II | 1 311 | 1 311 | 0% | 807.46 | 408.38 | -37% | 900 942 | 614 151 | -286 790 | -37% | |
| | Euro III | 7 087 | 7 087 | 0% | 817.66 | 543.45 | -33% | 5 794 876 | 3 580 626 | -2 214 250 | -38% | |
| | Euro IV | 20 062 | 20 062 | 0% | 538.17 | 279.34 | -48% | 16 581 727 | 9 852 452 | -6 729 275 | -40% | |
| | Euro V | 30 062 | 30 062 | 0% | 367.77 | 279.34 | -24% | 7 965 414 | 5 687 045 | -2 268 369 | -28% | |
| | Euro VI | 264 365 | 264 365 | 0% | 266.16 | 154.36 | -41% | 49 280 789 | 31 635 347 | -17 645 442 | -36% | |
| 1.A.3.b.iii - Motorized Two-Wheelers (M2W) | Gasoline | Euro VII | 335 065 | 335 065 | 0% | 65.52 | 154.36 | 133% | 21 985 366 | 51 736 641 | 29 751 275 | 136% |
| | | Trucks Total | 598,263 | 598,263 | 0% | 195.92 | 175.92 | -10% | 116,617,141 | 105,248,508 | -11,368,633 | -10% |
| | | pre-Euro | 5 336 | 5 336 | 0% | 125.91 | 157.19 | 25% | 671 088 | 830 789 | 168 801 | 25% |
| | | Euro I | 3 257 | 3 257 | 0% | 126.39 | 177.86 | 41% | 411 617 | 579 244 | 167 627 | 41% |
| | | Euro 2 | 3 396 | 3 396 | 0% | 122.55 | 180.33 | 47% | 416 290 | 673 540 | 257 250 | 62% |
| | | Euro 3 | 6 711 | 6 711 | 0% | 41.22 | 180.33 | 263% | 271 187 | 1 396 566 | 1 065 379 | 283% |
| | M2Ws Total | Euro 4 | 430 | 430 | 0% | 18.26 | 180.33 | 987% | 7 982 | 85 275 | 77 293 | 968% |
| | | Euro 5 | 0 | 0 | 0% | 0.00 | 0.00 | 0% | 0 | 0 | 0 | 0% |
| | | LDVs total | 19,160 | 19,160 | 0% | 52.81 | 183.39 | 366% | 1 178,624 | 5 551,381 | 1 735,114 | 366% |
| | 1.A.3.b - Road Transport | Total | 2,251,471 | 2,251,471 | 0% | 213.43 | 175.23 | -42% | 525 540 430 | 384 485 986 | -141 054 444 | -27% |

Adjustment details for 2008

| ACTIVITY DATA | | | | | | | | | | | | |
|---|------------------|------------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|-------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | difference | | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [t] | in [t] | in [%] | | |
| 1.A.3.a.i - Passenger Cars | Gasoline | pre-Cars | 12 219 | 12 219 | 0% | 637.58 | 644.11 | -10% | 7 790 965 | 6 668 721 | -1 122 234 | -15% |
| | | Car 1 | 14 362 | 14 362 | 0% | 374.34 | 341.68 | -9% | 5 371 161 | 3 448 643 | -1 922 518 | -36% |
| | | Car 2 | 34 285 | 34 285 | 0% | 221.97 | 111.68 | -60% | 5 360 977 | 2 688 163 | -2 672 814 | -50% |
| | | Car 3 | 43 642 | 43 642 | 0% | 88.16 | 76.96 | -13% | 3 897 781 | 3 388 617 | -509 164 | -13% |
| | | Car 4 | 275 738 | 275 738 | 0% | 55.98 | 52.30 | -7% | 15 683 498 | 14 576 755 | -1 106 743 | -7% |
| | | Car 5 | 186 830 | 186 830 | 0% | 19.35 | 52.30 | -170% | 3 228 282 | 8 725 688 | 5 497 406 | 170% |
| | Diesel Oil | pre-Cars | 699 007 | 699 007 | 0% | 64.40 | 68.36 | -6% | 45 032 964 | 47 186 871 | 2 153 886 | 5% |
| | | Car 1 | 1 383 | 1 383 | 0% | 303.55 | 261.96 | -14% | 386 246 | 265 173 | -121 073 | -31% |
| | | Car 2 | 2 949 | 2 949 | 0% | 268.57 | 229.65 | -15% | 862 432 | 775 465 | -86 967 | -10% |
| | | Car 3 | 10 784 | 10 784 | 0% | 407.20 | 222.67 | -45% | 4 391 393 | 2 483 536 | -1 907 858 | -45% |
| | | Car 4 | 40 786 | 40 786 | 0% | 812.49 | 180.15 | -78% | 24 932 029 | 7 333 241 | -17 598 788 | -71% |
| | | Car 5 | 130 534 | 130 534 | 0% | 414.71 | 180.40 | -56% | 54 133 837 | 20 937 329 | -33 196 508 | -61% |
| | Trucks & Lorries | pre-Cars | 251 212 | 251 212 | 0% | 416.25 | 180.40 | -56% | 104 585 786 | 40 293 731 | -64 292 055 | -61% |
| | | Car 5 | 220 685 | 220 685 | 0% | 254.87 | 180.40 | -31% | 93 284 140 | 35 680 446 | -57 603 694 | -62% |
| | | Diesel oil total | 666 076 | 666 076 | 0% | 375.66 | 163.38 | -56% | 247 596 063 | 188 768 684 | -158 767 459 | -56% |
| | | 100% Total | 1 365 181 | 1 365 181 | 0% | 214.34 | 154.68 | -26% | 262 589 060 | 156 555 421 | -106 033 639 | -40% |
| 1.A.3.b.i - Light Duty Vehicles (LDVs) | Gasoline | pre-Cars | 917 | 917 | 0% | 685.53 | 645.95 | -7% | 596 859 | 582 682 | -14 177 | -2% |
| | | Car 1 | 189 | 189 | 0% | 911.58 | 312.78 | -66% | 99 529 | 33 895 | -65 634 | -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 | 5% | 57 282 | 60 739 | 3 457 | 6% |
| | | Car 4 | 1 275 | 1 275 | 0% | 52.02 | 54.36 | 4% | 65 290 | 69 270 | 3 980 | 4% |
| | | Car 5 | 1 483 | 1 483 | 0% | 23.70 | 54.36 | 129% | 35 160 | 80 626 | 45 466 | 129% |
| | Diesel Oil | pre-Cars | 1 643 | 1 643 | 0% | 19.18 | 54.36 | 182% | 39 550 | 89 326 | 49 776 | 182% |
| | | Gasoline total | 6 315 | 6 315 | 0% | 154.22 | 160.11 | 4% | 999 199 | 1 011 136 | 11 937 | 1% |
| | | Car 1 | 1 872 | 1 872 | 0% | 411.51 | 386.79 | -6% | 771 337 | 574 432 | -196 905 | -26% |
| | | Car 2 | 1 285 | 1 285 | 0% | 389.84 | 276.25 | -29% | 493 129 | 272 296 | -220 833 | -45% |
| | | Car 3 | 2 942 | 2 942 | 0% | 318.56 | 153.88 | -52% | 965 389 | 550 789 | -414 600 | -43% |
| | | Car 4 | 9 363 | 9 363 | 0% | 558.10 | 150.74 | -73% | 5 689 152 | 1 411 299 | -4 277 853 | -75% |
| | Trucks & Lorries | pre-Cars | 33 232 | 33 232 | 0% | 508.42 | 93.81 | -81% | 15 929 185 | 3 117 457 | -12 811 728 | -80% |
| | | Car 5 | 66 283 | 66 283 | 0% | 432.92 | 93.81 | -79% | 28 684 080 | 6 217 860 | -22 466 220 | -78% |
| | | Diesel oil total | 39 482 | 39 482 | 0% | 158.79 | 93.81 | -41% | 5 941 615 | 3 686 228 | -2 255 387 | -38% |
| | | 100% Total | 154 259 | 154 259 | 0% | 384.71 | 182.69 | -53% | 59 344 525 | 15 880 316 | -43 464 210 | -73% |
| 1.A.3.b.ii - Heavy Duty Vehicles (HDVs) | Gasoline | pre-Cars | 180 574 | 180 574 | 0% | 375.80 | 184.94 | -51% | 69 343 125 | 16 851 449 | -52 491 676 | -76% |
| | | Car 1 | 547 | 547 | 0% | 1078.16 | 1919.23 | -43% | 585 267 | 557 147 | -28 120 | -5% |
| | | Car 2 | 237 | 237 | 0% | 732.78 | 732.57 | 0% | 173 676 | 178 368 | 4 692 | 3% |
| | | Car 3 | 2 270 | 2 270 | 0% | 787.83 | 646.33 | -18% | 1 780 686 | 1 487 437 | -293 249 | -16% |
| | | Car 4 | 6 757 | 6 757 | 0% | 628.89 | 459.32 | -27% | 4 262 734 | 3 183 482 | -1 079 252 | -25% |
| | | Car 5 | 3 043 | 3 043 | 0% | 473.16 | 382.73 | -19% | 1 439 790 | 1 073 333 | -366 457 | -26% |
| | Diesel Oil | pre-Cars | 18 189 | 18 189 | 0% | 362.42 | 186.37 | -49% | 6 463 265 | 3 376 016 | -3 087 249 | -48% |
| | | Car 5 | 20 670 | 20 670 | 0% | 64.89 | 186.37 | 288% | 1 176 026 | 3 682 314 | 2 506 288 | 213% |
| | | Gasoline total | 51 634 | 51 634 | 0% | 309.75 | 283.53 | -9% | 15 993 546 | 13 687 186 | -2 306 360 | -15% |
| | | Car 2 | 3 262 | 3 262 | 0% | 1034.82 | 737.35 | -29% | 3 375 359 | 2 485 071 | -890 288 | -26% |
| | | Car 3 | 1 094 | 1 094 | 0% | 747.82 | 488.39 | -35% | 918 052 | 512 378 | -405 674 | -44% |
| | | Car 4 | 5 544 | 5 544 | 0% | 817.44 | 581.68 | -29% | 4 532 180 | 2 781 516 | -1 750 664 | -39% |
| | Trucks & Lorries | pre-Cars | 20 583 | 20 583 | 0% | 629.54 | 563.68 | -11% | 12 367 751 | 7 277 279 | -5 090 472 | -41% |
| | | Car 5 | 15 912 | 15 912 | 0% | 358.89 | 276.23 | -23% | 6 334 421 | 4 386 424 | -1 947 997 | -31% |
| | | Diesel oil total | 154 983 | 154 983 | 0% | 250.40 | 154.68 | -38% | 45 964 153 | 24 283 389 | -21 680 764 | -47% |
| | | 100% Total | 381 799 | 381 799 | 0% | 68.78 | 154.68 | 125% | 26 251 482 | 69 665 886 | 43 414 404 | 165% |
| 1.A.3.b.iii - Motorised Two-Wheelers (MTWs) | Gasoline | pre-Cars | 585 186 | 585 186 | 0% | 575.18 | 172.19 | -70% | 188 173 537 | 180 760 889 | -7 412 648 | -4% |
| | | Car 1 | 4 940 | 4 940 | 0% | 128.95 | 188.61 | 46% | 622 656 | 783 451 | 160 795 | 26% |
| | | Car 2 | 2 966 | 2 966 | 0% | 128.14 | 177.79 | 41% | 374 114 | 527 294 | 153 180 | 41% |
| | | Car 3 | 3 221 | 3 221 | 0% | 128.33 | 188.64 | 46% | 387 596 | 639 833 | 252 237 | 65% |
| | | Car 4 | 6 241 | 6 241 | 0% | 48.24 | 188.64 | 288% | 21 126 | 1 239 686 | 1 218 560 | 578% |
| | | Car 5 | 1 130 | 1 130 | 0% | 58.41 | 188.64 | 324% | 23 066 | 224 682 | 201 616 | 875% |
| | Trucks & Lorries | pre-Cars | 0 | 0 | 0% | 0.00 | 188.64 | 0% | 0 | 0 | 0 | 0% |
| | | Car 5 | 0 | 0 | 0% | 0.00 | 188.61 | 198% | 1 658 558 | 3 454 767 | 1 796 209 | 108% |
| | 100% Total | pre-Cars | 2 180 983 | 2 180 983 | 0% | 215.85 | 133.49 | -48% | 478 758 286 | 291 129 652 | -187 628 634 | -39% |
| | | Car 5 | 2 180 983 | 2 180 983 | 0% | 215.85 | 133.49 | -48% | 478 758 286 | 291 129 652 | -187 628 634 | -39% |

Adjustment details for 2009

| Table 1: Activity Data and Implied Emission Factors for NFR Codes | | | | | | | | | | | | |
|---|------------------|---------------|-----------|------------|-------------------------|----------|------------|---------------------------|-------------|--------------|--------------|------|
| NFR Code | Fuel | Activity Data | | | Implied Emission Factor | | | NO _x Emissions | | | | |
| | | current | adjusted | difference | current | adjusted | difference | current | adjusted | difference | | |
| | | in [t] | in [t] | in [%] | in [g/t] | in [g/t] | in [%] | in [t] | in [t] | in [%] | | |
| 1.A.3.a.i - Passenger Cars | Gasoline | pre-Cars | 13 588 | 13 588 | 0% | 638.58 | 644.11 | -6% | 8 664 621 | 7 382 686 | -1 281 935 | -15% |
| | | Car 1 | 12 427 | 12 427 | 0% | 378.32 | 341.68 | -9% | 4 781 480 | 3 083 383 | -1 698 097 | -36% |
| | | Car 2 | 20 086 | 20 086 | 0% | 225.58 | 92.59 | -59% | 4 531 070 | 1 858 018 | -2 672 852 | -59% |
| | | Car 3 | 38 216 | 38 216 | 0% | 82.22 | 76.12 | -7% | 2 977 840 | 2 829 186 | -148 654 | -5% |
| | | Car 4 | 295 220 | 295 220 | 0% | 57.04 | 53.29 | -7% | 14 588 285 | 13 589 621 | -998 664 | -7% |
| | | Car 5 | 180 537 | 180 537 | 0% | 19.77 | 53.29 | -170% | 3 173 728 | 8 054 356 | 4 880 628 | 170% |
| | Diesel Oil | pre-Cars | 285 636 | 285 636 | 0% | 25.63 | 62.30 | -180% | 5 295 099 | 11 010 782 | 5 715 683 | 108% |
| | | Car 1 | 194 631 | 194 631 | 0% | 62.30 | 68.45 | 10% | 43 961 941 | 48 238 025 | 4 276 084 | 10% |
| | | Car 2 | 3 735 | 3 735 | 0% | 333.74 | 264.96 | -21% | 913 180 | 734 621 | -178 559 | -21% |
| | | Car 3 | 2 545 | 2 545 | 0% | 298.80 | 272.65 | -9% | 784 913 | 687 786 | -97 127 | -12% |
| | | Car 4 | 8 891 | 8 891 | 0% | 407.19 | 229.16 | -44% | 3 620 286 | 2 037 480 | -1 582 806 | -44% |
| | | Car 5 | 33 079 | 33 079 | 0% | 815.11 | 180.42 | -78% | 20 310 125 | 5 967 483 | -14 342 642 | -71% |
| | Trucks & Lorries | pre-Cars | 111 335 | 111 335 | 0% | 419.17 | 182.44 | -56% | 48 688 685 | 10 085 228 | -38 603 457 | -80% |
| | | Car 5 | 231 784 | 231 784 | 0% | 419.37 | 182.44 | -60% | 95 117 643 | 37 650 997 | -57 466 646 | -60% |
| | Trucks Total | | 273 511 | 273 511 | 0% | 227.36 | 182.44 | -29% | 62 183 230 | 44 429 184 | -17 754 046 | -29% |
| | 100% Total | | 663 841 | 663 841 | 0% | 345.81 | 165.67 | -52% | 229 566 088 | 189 582 982 | -139 983 106 | -61% |
| | 100% Total | | 1 368 532 | 1 368 532 | 0% | 699.83 | 155.32 | -78% | 273 668 069 | 157 821 687 | -115 846 382 | -42% |
| 1.A.3.b.i - Heavy Duty Vehicles (HDVs) | Gasoline | pre-Cars | 909 | 909 | 0% | 644.89 | 645.95 | -2% | 687 449 | 581 962 | -105 487 | -15% |
| | | Car 1 | 87 | 87 | 0% | 915.20 | 312.78 | -66% | 89 953 | 30 396 | -59 557 | -66% |
| | | Car 2 | 316 | 316 | 0% | 304.63 | 224.45 | -26% | 95 158 | 70 848 | -24 310 | -26% |
| | | Car 3 | 447 | 447 | 0% | 112.68 | 121.47 | 8% | 59 355 | 54 283 | -5 072 | -9% |
| | | Car 4 | 1 126 | 1 126 | 0% | 53.08 | 55.26 | 4% | 59 652 | 62 199 | 2 547 | 4% |
| | | Car 5 | 1 361 | 1 361 | 0% | 25.34 | 55.26 | 190% | 34 240 | 74 680 | 40 440 | 190% |
| | Diesel Oil | pre-Cars | 2 420 | 2 420 | 0% | 18.75 | 62.30 | -180% | 45 383 | 133 753 | 88 370 | 190% |
| | | Car 1 | 6 483 | 6 483 | 0% | 184.88 | 153.25 | -17% | 974 299 | 1 044 150 | 69 851 | 7% |
| | | Car 2 | 1 744 | 1 744 | 0% | 418.96 | 386.79 | -7% | 725 111 | 541 376 | -183 735 | -26% |
| | | Car 3 | 1 079 | 1 079 | 0% | 389.52 | 276.25 | -29% | 420 285 | 232 256 | -188 029 | -45% |
| | Trucks & Lorries | pre-Cars | 2 334 | 2 334 | 0% | 319.77 | 160.78 | -50% | 3 177 082 | 434 880 | -2 742 202 | -86% |
| Car 4 | | 7 649 | 7 649 | 0% | 411.11 | 154.79 | -26% | 4 587 942 | 1 152 179 | -3 435 763 | -75% | |
| Trucks Total | | 20 711 | 20 711 | 0% | 512.28 | 34.57 | -82% | 14 768 380 | 2 716 154 | -11 952 154 | -82% | |
| Trucks Total | | 58 974 | 58 974 | 0% | 434.30 | 84.57 | -79% | 35 499 680 | 5 552 420 | -30 947 152 | -79% | |
| Trucks Total | | 58 974 | 58 974 | 0% | 145.18 | 84.57 | -30% | 6 641 626 | 5 072 882 | -1 568 744 | -23% | |
| 100% Total | | 159 183 | 159 183 | 0% | 347.42 | 181.99 | -71% | 55 383 335 | 36 291 485 | -19 091 850 | -37% | |
| 100% Total | | 165 866 | 165 866 | 0% | 319.31 | 183.97 | -43% | 56 279 584 | 37 245 596 | -19 033 988 | -37% | |
| 1.A.3.b.ii - Heavy Duty Vehicles (HDVs) | Diesel Oil | pre-Cars | 489 | 489 | 0% | 1080.20 | 1919.23 | -43% | 588 987 | 478 258 | -110 729 | -19% |
| | | Car 1 | 147 | 147 | 0% | 736.37 | 752.57 | 2% | 186 212 | 110 593 | -75 619 | -39% |
| | | Car 2 | 1 611 | 1 611 | 0% | 703.47 | 646.77 | -9% | 1 272 044 | 1 044 621 | -227 423 | -18% |
| | | Car 3 | 5 709 | 5 709 | 0% | 629.65 | 556.55 | -11% | 3 686 351 | 2 968 512 | -717 839 | -19% |
| | | Car 4 | 2 747 | 2 747 | 0% | 473.50 | 352.84 | -25% | 1 381 461 | 969 413 | -412 048 | -30% |
| | | Car 5 | 17 130 | 17 130 | 0% | 363.91 | 186.64 | -49% | 6 213 175 | 3 180 391 | -3 032 784 | -49% |
| | Trucks & Lorries | pre-Cars | 25 135 | 25 135 | 0% | 68.43 | 186.84 | -269% | 1 518 981 | 4 686 133 | 3 167 152 | 209% |
| | | Car 5 | 52 939 | 52 939 | 0% | 214.81 | 247.81 | 16% | 14 527 012 | 15 198 578 | 671 566 | 5% |
| | Trucks Total | | 3 140 | 3 140 | 0% | 1034.98 | 717.35 | -29% | 3 250 020 | 2 376 443 | -873 577 | -27% |
| | Trucks Total | | 9 589 | 9 589 | 0% | 747.80 | 480.39 | -37% | 724 240 | 453 754 | -270 486 | -37% |
| | Trucks Total | | 4 560 | 4 560 | 0% | 817.42 | 581.34 | -29% | 3 734 343 | 2 288 967 | -1 445 376 | -39% |
| Trucks & Lorries | pre-Cars | 15 327 | 15 327 | 0% | 628.94 | 361.48 | -44% | 19 380 323 | 5 756 580 | -13 623 743 | -70% | |
| | Car 1 | 13 137 | 13 137 | 0% | 394.86 | 273.43 | -31% | 1 226 079 | 3 636 330 | 2 410 251 | 197% | |
| | Car 2 | 185 213 | 185 213 | 0% | 265.13 | 100.76 | -62% | 16 969 889 | 39 441 418 | 22 471 529 | 133% | |
| | Car 3 | 432 490 | 432 490 | 0% | 72.38 | 154.76 | 112% | 31 175 486 | 67 683 653 | 36 508 167 | 118% | |
| Trucks Total | | 595 913 | 595 913 | 0% | 951.35 | 169.12 | -82% | 95 380 180 | 180 889 356 | 85 509 176 | 90% | |
| 100% Total | | 4 813 | 4 813 | 0% | 125.89 | 144.79 | 31% | 664 997 | 792 771 | 127 774 | 31% | |
| 100% Total | | 2 835 | 2 835 | 0% | 139.30 | 177.29 | 41% | 35 456 | 582 589 | 547 133 | 41% | |
| 100% Total | | 3 094 | 3 094 | 0% | 113.33 | 180.66 | 67% | 389 224 | 615 317 | 226 093 | 67% | |
| 100% Total | | 6 082 | 6 082 | 0% | 49.03 | 180.66 | 37% | 240 284 | 1 183 617 | 943 333 | 37% | |
| 100% Total | | 2 085 | 2 085 | 0% | 21.68 | 180.66 | 871% | 43 489 | 380 667 | 336 178 | 871% | |
| 100% Total | | 0 | 0 | 0% | 0.00 | 180.66 | 0% | 0 | 0 | 0 | 0% | |
| 100% Total | | 18 150 | 18 150 | 0% | 86.95 | 186.83 | 157% | 5 613 490 | 5 562 941 | -50 549 | -1% | |
| 100% Total | | 2 262 080 | 2 262 080 | 0% | 158.58 | 132.83 | -33% | 437 268 744 | 292 491 437 | -144 777 307 | -33% | |

REVISION OF ADJUSTMENT PROPOSAL COMPARED TO SUBMISSIONS 2014 to 2019

Table 2: annual NO_x adjustment proposals, in kilotonnes

| | 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 only 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 Ségur 75302 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

⁴⁾ EB, 2012b: CLRTAP EB Decision 2012/4: Provisional Application of Amendment to the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone URL:

http://www.unece.org/fileadmin/DAM/env/documents/2013/air/ECE_EB.AIR_111_Add.1__ENG_DECISION_4.pdf

⁵⁾ ifeu, 2002: Final report to UFOPLAN study FKZ 201 45 112 (German version only): Aktualisierung des Daten- und Rechenmodells: Energieverbrauch und Schadstoffemissionen des motorisierten Verkehrs in Deutschland 1980-2020; Im Auftrag des Umweltbundesamtes; ifeu Institut für Energie- und Umweltforschung Heidelberg GmbH (Institute for Energy and Environmental Research), Wilckensstraße 3, D-69120 Heidelberg, Germany, phone: +49 (0) 6221 / 47 67 -0, fax: +49 (0) 6221 / 47 67 -19, Heidelberg, 31. Oktober 2002

⁶⁾ Knörr et al. (2020a): Knörr, W., Heidt, C., Gores, S., & Bergk, F.: ifeu Institute for Energy and Environmental Research (Institut für Energie- und Umweltforschung Heidelberg gGmbH, ifeu): Fortschreibung des Daten- und Rechenmodells: Energieverbrauch und Schadstoffemissionen des motorisierten Verkehrs in Deutschland 1960-2035, sowie TREMOD, im Auftrag des Umweltbundesamtes, Heidelberg & Berlin, 2020.

⁷⁾ CEIP, 2014a: Centre on Emission Inventories and Projections (CEIP): CEIP/Adjustment RR/2014/GERMANY: Review of the 2014 Adjustment Application by Germany, URL:

https://webdab01.umweltbundesamt.at/download/adjustments2014/Adjustment_Review_Report_GERMANY_2014.pdf?cgiproxy_skip=1, 5 August 2014.

⁹⁾ CEIP, 2015a: Centre on Emission Inventories and Projections (CEIP): CEIP/Adjustment RR/2015/Germany: Review of the 2015 Adjustment Application by Germany, URL:

https://webdab01.umweltbundesamt.at/download/adjustments2015/Germany2015-adj.pdf?cgiproxy_skip=1, September 2015.

¹⁰⁾ CEIP, 2015b: Centre on Emission Inventories and Projections (CEIP):

CE/EB.AIR/GE.1/2015/10–ECE/EB.AIR/WG.1/2015/13: Review of adjustment applications 2015; URL:

http://www.ceip.at/fileadmin/inhalte/emep/Adjustments/ece.eb.air.ge.1.2015.10_ece.eb.air.wg.1.2015.13.AV.pdf, 6 July 2015.

¹¹⁾ CEIP, 2016a: Centre on Emission Inventories and Projections (CEIP): Review of the 2016 Adjustment Application by Germany, URL:

https://webdab01.umweltbundesamt.at/download/adjustments2016/Germany2016-adj.pdf?cgiproxy_skip=1, 2016.

¹²⁾ CEIP, 2016b: Centre on Emission Inventories and Projections (CEIP):

ECE/EB.AIR/GE.1/2016/10–ECE/EB.AIR/WG.1/2016/18: Review of adjustment applications 2016; URL:

http://www.ceip.at/fileadmin/inhalte/emep/pdf/2016/ECE_EB.AIR_GE.1_2016_10_E.pdf, 2016.

¹³⁾ CEIP, 2017a: Centre on Emission Inventories and Projections (CEIP):

ECE/EB.AIR/GE.1/2017/10–ECE/EB.AIR/WG.1/2017/20: Review of adjustment applications 2017; URL:

http://www.ceip.at/fileadmin/inhalte/emep/pdf/2017/Advance_ece_eb_air_ge_1_2017_10_ece_eb_air_wg_1_2017.pdf, 2017.

¹⁴⁾ CEIP, 2018a: ECE/EB.AIR/GE.1/2018/10–ECE/EB.AIR/WG.1/2018/21: Review of adjustment applications 2018; URL:

https://www.ceip.at/fileadmin/inhalte/emep/pdf/2018/Adj_ece.eb.air.ge.1.2018.10-ece.eb.air.wg.1.2018.21_advance.pdf, 2018.

¹⁵⁾ CEIP, 2018b:

https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2018/adj_ece.eb.air.ge.1.2018.10-ece.eb.air.wg.1.2018.21_advance.pdf

¹⁶⁾ CEIP, 2019a: Centre on Emission Inventories and Projections (CEIP):

ECE/EB.AIR/GE.1/2019/10–ECE/EB.AIR/WG.1/2019/22: Review of adjustment applications 2019; URL: https://www.ceip.at/fileadmin/inhalte/emep/pdf/2019/ECE_EB.AIR_GE.1_2019_10-1909789E.pdf, 2019.

¹⁷⁾ CEIP, 2019b:

https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2019/ece_eb.air_ge.1_2019_10-1909789e.pdf

¹⁸⁾ CEIP, 2020:

https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2020/adj-status_ece_eb.air_ge.1_2020_10-2008939e.pdf

¹⁹⁾ Keller et al. (2017): Keller, M., Hausberger, S., Matzer, C., Wüthrich, P., & Notter, B.: Handbook Emission Factors for Road Transport, version 3.3 (Handbuch Emissionsfaktoren des Straßenverkehrs 3.3) URL:

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwj0y67pi5foAhWB16QKHfpYDIgQFjAAegQIAhAB&url=https%3A%2F%2Fwww.hbefa.net%2Fd%2Fdocuments%2FHBFEFA33_Hintergrundbericht.pdf&usg=AOvVaw2sOF884KtccVyWLIdt1CIZ -

Dokumentation, Bern, 2017.

²⁰⁾ Notter et al. (2019): Keller, M., Althaus, H.-J., Cox, B., Knörr, W., Heidt, Ch., Biemann, K., Räder, D.: Handbook Emission Factors for Road Transport, version 4.1 (Handbuch Emissionsfaktoren des Straßenverkehrs 4.1), HBEFA 4.1 Development Report; URL:

https://www.hbefa.net/e/documents/HBEFA41_Development_Report.pdf, Bern, Heidelberg, 21. August 2019.