adjustment de-a 1/11

# **Adjustment DE-A regarding NOx 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) <sup>1)</sup>. 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, 2012a & c) <sup>2)</sup>, <sup>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,,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) <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,,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+

adjustment de-a 2/11

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,, 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 <u>evolution of the different so-called Euro norms</u>) 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 (<u>Germany: stronger dieselisation</u> 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 EM $^1$ 

^^1^^ "artificial" current emissions = virtual current emissions assuming no changes in emission factors

math 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"} math

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 than, 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 compliling its road transport emissions inventory but a national model called

adjustment de-a 3/11

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 (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,,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 technocological 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 tehrefore 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 6.02 (Knörr et al., 2019a)  $^{7}$ ).

Description of the updated methodology used

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

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

and

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

Comparison of emission estimates made using the original and updated methodologies

The values of NO,,x,, emissions presented in the table below are estimated with:

• TREMOD 3.1 model equations as initial methodology

and,

TREMOD 6.12 equations as methodology applied for NEC submission 2021.

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

Table 1: Resulting adjustment proposal 2020

for year	2010	2011	2012	2013	2014	2015	2016	2017	2018
proposed adjustment	-297.8	-302.3	-301.3	-306.1	-294.5	-269.0	-244.3	-214.9	-174.6

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

adjustment\_de-a 4/11

- \* 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

- ajassirein o	vervieur fi	or years	2010 to 2015									
NED Code	Food	w		ctivity Date				n Factor		NO, Em		
NFR Code	Fuel	Year	current in [		difference in [S]	in [kg		difference in [%]	current	adjusted in [kg]	adjustment	in [%]
1.A.3.bi	gasoline		796.957	795.957	0%	97,55	84,99	-13%	77.644.842	67,650,906	9.993.935	-13%
1.A.3.b1	diesel oil		529,300	529,300	0%	429,46	190,51	-63%	227.341.096	84.970.461		-63%
1.A.3.bii	gasoline		6.325	6.325	0%	255,87	214,75	-16%	1.618.432 54.040.533	1.358.328	250.104	-16%
1.A.3.bii 1.A.3.bii	diesel oil diesel oil		113,450 48,044	113,450 48,044	0%	475,34 623.00	134,96 482,55	-72% -23%	29.931.266	15.311.584 23.183.732	38.728.949 6.747.534	-72% -23%
1A3.bii	diesel oil		566.741	566,741	0%	446,67	271,83	-39%	253.148.243	154.056.160	99.092.083	-31%
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 TOT	AL	2010	2.079.608	2.079,608	0%			0%	645.965.162	349.851.206		-46%
1.A.3.b1	gasoline		794.688	794,688	0%	92.09	81,61	-11%	73.185.851	64.851.951	8.333.900	-11%
1.A.3.bii 1.A.3.bii	diesel oil gasoline		553,564 6,118	553.564 6.118	0% 0%	434,12 229,35	159,22	-63% -13%	1.403.081	1.214.776	162.174.832	-67% -13%
1A3bii	diesel oil		115.967	115.967	0%	481,55	126.92	-74%	55.844.518	14,718,142	41.125.376	-74%
1.A.3.b III	diesel oil		47,365	47,365	0%	692,66	448,99	-24%	28.071.221	21.266.323	6.864.898	-24%
1A3bii	diesel oil		563.891	563.891	0%	410,38	244,97	-40%	231.410.271	138.136.342	93.273.929	-41%
1.A.3.b iv	gasoline		19.289	19.289	0%	110,79	171,60	54%	2.137.002	331,625,655	-1.162.160 300.740.081	54%
1.A.3.b TOTA 1.A.3.b i	AL. casoline	2011	2.100.883 750.957	2.100.883 750.957	0%	85.73	78,00	-0%	632.365.736 64.379.994	58.577.229	5.802.765	-48% -0%
1.A.3.bi	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.bii	gassine		5.657	5.657	0%	218,93	193,15	-12%	1.238.520	1.092.662	145.859	-12%
1.A.3.bii	diesel oil		114,350	114,350	0%	481,91	120,17	-75%	55.106.382	13.741.354	41.365.028	-75%
1.A.3.bii	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.bii 1.A.3.biv	diesel oil gasoline		589,585 18,268	589.595 18.268	0%	381,33 107,43	224,00 173,28	-41% 61%	224.829.180 1.962.546	132.064.753 3.165.439	92.764.428	-41% 61%
1.A.3.6 TOTA		2012	2.084,964	2.084,964	0%	107,63	11-3,26	91% 0%		316.301.343		495
1.A.3.bi	gasoline	30.02	749.114	749.114	0%	80,35	74,85	-7%	60.190.007	56.071.797	4.118.211	-7%
1.A.3.bi	diesel oil		589,131	589,131	0%	437,14	158,71	-64%	257.533.728	93.499.010		-64%
1.A.3.b II	gasoline		5.578	5.578	0%	202,80	184,07	-9%	1.131.209	1.026.727	184.482	-9%
1.A.3.bii 1.A.3.bii	diesel oil diesel oil		118.777 51.716	118.777 51.796	0% 0%	480,60 509,54	114,93 360,06	-76% -29%	57.083.533 26.350.969	18.620.843	43.433.045 7.730.126	-76% -29%
1A3bii	diesel oil		600.139	600 139	0%	353.06	207.93	41%	211.887.531	124,788,469	87,099,062	41%
1.A.3.bW	gasoline		18.229	18.229	0%	104.34	175,38	68%	1.902.088	3.197.038	-1.294.951	68%
1.A.3.b TOT	AL.	2013	2.132.683	2.132,683	0%			0%	616,079,063	310.854.371	305,224,692	-50%
1.A.3.bi	gaseline		752.526	752,526	0%	76,03	73,09	-4%	57.215.533	54.998.921	2.216.612	-4%
1.A.3.bi	diesel oil		626.045	626.045	0%	435,87	159,12	-63% -7%	272.876.061 1.112.584	99.613.892	173.262.169	-63% -7%
1.A.3.bii 1.A.3.bii	gaseline diesel oil		5.845 128.578	5.845 128.578	0% 0%	190,34 475,56	110,96	-77%	61.146.575	14.267.237	46.879.338	-77%
1A3bii	diesel oil		49.143	49.143	0%	468.37	339,99	-27%	23.017.115	16.708.234	6.300.001	-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.biv	gasoline		18.673	18.673	0%	100,59	179,24	78%	1.878.294	3.345.794	-1.468.499	78%
1.A.3.b TOTA 1.A.3.b i		2014	2.153.563 715.158	2.153.563 715.156	0%	74.38	71,73	4%	597.120.297 53.190.787	51,300,983	294.868.025 1.889.905	4%
1.A.3.bi	gasoline diesel oil		645,565	645.565	0%	426.19	159,80	43%	275.130.233	103.163.501		-43%
1A3bii	gasoline		5.793	5.793	0%	187,12	172,80	-8%	1.083.927	1.000.999	82.928	-8%
1.A.3.bii	diesel oil		135,386	135,306	0%	469,35	107,96	-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.bii 1.A.3.biv	diesel oil gasoline		589.411 18.459	589.411 18.459	0% 0%	266,69 99,32	187,51	-30% 82%	187.109.676	3.334.472	46.668.973 -1.501.090	-30% 82%
1A.3.6 TOTA		2015	2.161.976	2.161,976	0%	99,32	189,00	0%	575,931,265	301,077,596	274.853.670	48%
1.A.3.bi	gasoline	2012	716.272	715.272	0%	70.93	70.66	0%	50.736.967	50.535.049	201.918	0%
1.A.3.bi	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.bii	gasoline		5.926	5.926	0%	180,27	171,06	-5%	1.068.292	1.013.678	54.614	-5%
1.A.3.bii	diesel oil		144.068	144.068	0%	456,12	105,62	-77%	65.712.732	15.215.007	50.496.726	-77%
1.A.3.bii 1.A.3.bii	diesel oil		54.157 594.013	54.157 594.013	0% 0%	424,73 226,31	308,24	-27% -20%	23.002.109 134.431.899	16.693.117	6.308.992 26.935.637	-27% -20%
1.A.3.biv	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 TOT		2016	2.207.339	2.207.339	0%			0%	553,799,558	302,901,820	250.897.738	-45%
1.A.3.bi	gasoline		724.571	724.571	0%	67,66	69,88	3%	49.026.874	50.634.714	-1.607.840	3%
1.A.3.b1	diesel oil		696,592	696.592	0%	390,66	161,95	-59%	1.058.799	112.810.721	159.315.370 24.588	-59%
1.A.3.bii 1.A.3.bii	gasoline diesel oil		6.186 153.284	6.186 153.284	0% 0%	171,15 424.66	167,18	-2% -76%	1.058.799 65.093.930	1.034.211	24.588 49.168.714	-76%
1A3bii	diesel oil		53.382	53.382	0%	370,80	286,71	-23%	19.793.901	15.304.828	4.489.073	-23%
1.A.3.bii	diesel oil		598.263	598.263	0%	195,02	175,92	-10%	116.671.141	105.245.508	11.424.633	-10%
1.A.3.b iv	gasoline		19,160	19,160	0%	92,83	183,39	98%	1.778.674	3.513.787	-1.735.114	98%
1.A.3.6 TOTA		2017	2.251.437	2.251.437	0%	80.00		0% 6%	525.549.410	47 755 547	A 173 ASS	42%
1.A.3.bi 1.A.3.bi	gasoline diesel oil		699.027 666.074	686.074		64,42 371,66	68,36 163,30		247.666.063		-2.753.820 138.787.459	
	gasoline		6,315	6.315		158,22	160,11				-11.939	
	diesel oil		154.259			384,71	102,69		59.344.525			
	diesel oil		51,634	51,634	0%	309,76	263,63	-15%	15.993.526			-15%
1.A.3.bii	diesel oil		585.186	585,186		171,18	172,10		100.173.337			
1.A.3.b iv 1.A.3.b TOTA	gasoline	2018	18.497 2.180.993	18.497		89,66	184,61		1.658.558 470.758.206		-1.756.209 179.618.593	
	AL. gasoline	2018	704.691	704.691		62,30	68,45		479.758.206			
	diesel oil		663.841	663,841		345,81	165,07		229 566 088			
1.A.3.b ii	gasoline		6.683	6.683	0%	146,08	153,25	5%	976.219	1.024.160	-47.931	5%
	diesel oil		159,183	159,183		347,42	101,90		55.303.336			-71%
	diesel oil		52.939	52.939		274,41	247,81		14.527.012			
1.A.3.b ii	diesel oil		596.913	585.913		153,36	169,17		91.380.700	3.502.941		
	can place											
1.A.3.b iv 1.A.3.b TOTA	gasoline AL	2019	18.750 2.202.000	18.750		86,05	100,03		437.268.744			

adjustment\_de-a 5/11

				Activity Dat	3	Impli	ed Emission	Factor		NO <sub>3</sub> Emi	issions	
NFR Code	Fuel		current		difference	current	adjusted	difference	CUITERS	adjusted	adjustment	difference
			in		in [5]		ig/TJ]	in [5]		in [kg]		in [5]
		рьена	13,686	13,686	9%	594,76	614,35	-12%	7.996.060	6.996.917	-969.143	-12
		Ears 1	76,661	76,661	9%	338,60	207,71	-30%	25.915.925	19,199,292	-7.716.663	-30
		Ews 2	96,425	96.425	9%	172.05	136,03	-22%	16.590.020	13.020.026	-3.569.995	-22
	Gaspine	Euro 3	133,139	133,139	9%	58,51	70,18	20%	7.790.384	9.343.433	1.553.129	20
	Cataline	Euro 4	444.991	444.991	9%	42,27	42,19	0%	18.811.389	18,773,529	-37.858	0
		Euro 5	31,234	31,234	0%	18,61	42,19	127%	581.142	1.317.737	736.595	127
		Euro 6	0	0	0%	25,08	42,19	62%	2	3	1	62
14301.		Gasoline total	795,957	795,957	0%	97,55	84,99	.13%	77.644.042	67,650,986	.9.993.935	.13
Passenger		ребиз	1.916	1,916	9%	310,13	264,96	-19%	689.760	687.296	-96,506	-6
Cars		Eura 1	10.338	10,338	0%	294.62	295,17	-11%	3.066.428	2,741,307	-325,121	-11
		Euro 2	50,068	50,068	2%	405,90	219.19	-45%	20.372,795	10.974.210	-9.398.584	-46
		Eura 3	134.025	134 025	8%	542.04	178.54	-87%	72 646 173	23 929 236	48 716 957	-87
	Diesel Oil	Euro 4	279,154	279,184	25	384.37	140.58	43%	107,299,100	39,243,811	-68,055,349	-63
		Euro S	53.547	53.547	95	434.70	140.58	-60%	23,276,735	T.52T.796	-15,740,029	-60
		Euro 6	334	334	95	267.62	140.58	45%	85,044	46.963	-39.191	-60
		Diesel oil tutal	529,380	529,380	05	69.65	160,51	425	227.341.096	84,970,461	.149.370.635	.63
		PCs Total	1.195.107	1.395.307	65	210.12	115,16	505	304,985,938	152.621.367	.152.364.578	.5
					2%	627.09				134.621.367 886.871		- 3
		ha-Ena	1,249	1,249			645,96	3%	783.320		23.551	
		Euro 1	367	367	9%	861,05	297,39	-85%	386,969	196,020	-200.950	-85
		Euro 2	1.383	1.383	9%	264,75	184,41	-30%	368.848	256.917	-111.531	-30
	Gaseline	Euro 3	886	896	9%	82,47	90,63	10%	70.631	77,625	6.994	×
		Euro 4	2.420	2.400	9%	36,32	44,50	24%	87.987	188,679	20.772	24
		Euro S	49	49	0%	15,34	44,90	193%	TSO	2.210	1.458	193
AAAH.		Euro 6	0		9%			0%	9	0		
ight Duty		Gasoline total	6.105	6.105	8%	255,87	214,75	-19%	1.618.432	1.358.328	-260.104	.1
Vehicles		po Euro	4,876	4,876	9%	425,59	306,79	-29%	2.077.142	1,495,903	-681.239	-21
(LOVA)		Ears 1	5.989	5.989	8%	395.59	215.24	-45%	2.369.098	1.299.030	-1.080.069	-4
(county)		Euro 2	13,126	13,126	8%	336,76	193,10	-43%	4.420.360	2.534.731	-1.885.629	-43
		Euro 3	33.249	33,249	0%	53/1.01	150.58	-72%	17.685.883	5.086,780	-12.649.123	-77
	Diesel Oil	Euro 4	54.581	54.581	0%	491.42	80.00	-82%	36.821.836	4.540.722	-21.501.114	-82
		Ears 5	1,629	1,629	9%	427.50	80.00	-79%	696.296	164.434	-651,772	-79
		Euro 6	0	0	9%	961.73	89.69	-42%	7	4	-3	-65
		Diesel oil total	113,450	113,450	65	476.34	134,96	-72%	54.040.533	15,311,584	38.728.949	-7.
		LDVs Total	119,775	119,775	8%	464,70	139,18	-70%	55,658,966	16,649,913	-38.989.053	-71
		pre-Euro	3.382	3.382	9%	1086.25	1029,78	-8%	3.674.087	3.452.644	-221.423	
		Eurl	2,826	2.826	25	748.41	752.14	0%	2.117.871	2.125.585	7.723	1
		Earl	10.152	10.152	0%	801.86	643.47	-20%	8,140,119	6.532.213	-1.607.506	-20
A3bii.			15.000	15,090	95						-1.007.506 -2.797.567	
eavy Duty Vehicle:	Diesel Oil	Ears II				630,22	457,25	-20%	10.065.776	T.289.299		-21
Beses		Ears IV	5.461	5.461	9%	441,63	361,66	-02%	2.450.016	1.921.527	-629.409	-25
Ceses		Ears V	10.326	10.326	9%	337,26	182,30	-46%	3.482.417	1.882.544	-1.699.873	-5
		Ewa M	0	0	9%			0%		0		
		Buses Total	48,044	48,044	8%	623,00	482,55	-21%	29.931.296	23,183,732	4247.534	-2
		pre-Euro	10.185	10.185	9%	1040,16	787,37	-26%	10.510.623	T.754.138	-2.758.485	-26
		Eart	5.677	5.677	9%	750,59	575,55	-23%	4.261.383	3.257.601	-893.792	-21
A3bH-		Ears I	38.588	38.588	0%	817,62	524,79	-36%	31.525.526	20.234.619	-11.290.907	-30
leavy Duty Vehicle:	Diesel Oil	Ears II	198.933	198.933	9%	636,20	374,48	-41%	101.126.192	59.547.271	-61.608.921	-81
Trucks &	Design Off	Ears IV	69.636	69.636	9%	390,94	290,02	-26%	27.183.967	20.166.636	-7.817.232	-26
Lorries		Ears V	283,934	283,934	9%	276,62	161,86	-45%	79.640.643	43.115.897	-05.424.746	-4
		Ewe VI	0	0	9%			0%	0	0		
		Trucks Total	566,741	566,741	8%	446,67	271,83	-39%	253,148,243	154,056,160	-99,892,883	-3
		pre-Euro	7.973	7.973	9%	122.00	149.16	22%	972,721	1.189.303	216.582	Z
A3ble -		Euro 1	5.231	5.231	9%	123.77	185.74	34%	647,479	867,039	219.550	34
Motorised		Euro 2	3.587	3.587	95	941.96	194.21	30%	586.362	686,661	190.309	30
Two	Gaspine	Eura 3	2,900	2,900	9%	39.11	194.21	361%	116,190	567,002	452.034	38
Wheelers		Earl 4	0	0	9%			0%		0		- (
(MQWH)		Eura 6	0	ő	2%			0%		0		
		CHILD	Ų	ų								
		M2Ws Total	19,712	19,712	8%	113.68	168,43	48%	2.240,749	3.320.034	1.079.285	4

				estivity Date			ed Emission			MO <sub>3</sub> Emi		
MFR Code	Fuel				difference	CURTERAL	adjusted	difference	Current	adjusted	adjustment	differenc
			in []		in [N]		kg/TJ]	in [5]		in [kg]		in [5]
		ребиз	13.063	13.063	9%	890,06	634,69	-10%	7.729.236	6.979.436	-748.801	-10
		Ews 1	61,979	61,979	9%	347,86	240,16	-31%	21,560,430	14.884.961	-6.675.479	-01
		Ews 2	87.083	87,083	9%	179.38	136,68	-24%	15.620.983	11.883.792	-3.727.191	-24
	Gassine	Euro 3	124,330	124,330	9%	81,64	71,52	16%	7.663.891	8.891.671	1.227.780	9
	Cataline	Euro 4	442,185	442,185	9%	43,84	43.68	0%	19.384.914	19.316.439	-58.4TE	
		Euro 5	85.057	65.057	0%	18,58	43.68	135%	1.227.301	2,885,636	1.658.258	13
		Euro 6	- 1	- 1	9%	25,00	43,68	60%	17	26	11	0
14301.		Gasoline total	794,680	794,680	0%	92.09	81,61	.21%	73,185,851	64,851,951	#.333.900	
Passenger		ре-биз	1.711	1.711	9%	318,90	264,96	-15%	631.983	453.197	-79.606	-1
Cars		Eura 1	8.426	8.426	9%	297.32	295,85	-11%	2,505,115	2.239.997	-265.119	- 4
		Euro 2	42.614	42.614	2%	407.03	219.27	-45%	17.384.549	9.321.916	J 982 634	4
		Euro 3	121,429	121,429	9%	555.36	178.55	-88%	67,437,053	21.681.366	45.755.687	-8
	Diesel Oil	Eura 4	284.943	264.943	2%	388.08	143.46	43%	102.817.801	38.009.755	-54.808.846	-5
		Euro S	113,847	113,847	0%	435.12	143.46	-61%	49.536.968	95.332.974	-33 203 994	-5
		Euro 6	685	685	9%	253.50	143.46	45%	180.582	99.754	-00.748	- 4
		Diesel oil tutal	553,564	553,564	05	404.12	159,32	425	240,313,791	80,130,959	.152,174,832	
		PCs Total	1,348,252	1,348,252	65	212.52	113,47	.51%	313,499,642	152,990,910	.160.508.732	- 3
		рэ Еиз	1.084	1.084	2%	629.26	645.95	3%	682.274	790.373	18 099	
					8%	858,74	384.47					4
		Ears 1 Ears 2	283 1,164	283	7%	268.66	191.68	-85%	243.299 310.529	86.158 223.189	-157.132 -87.348	
								-28%				-2
	Gaseline	Euro 3	783	763	0%	85,97	95,39	11%	67.320	74.792	7.381	1
		Euro 4	2.562	2.562	0%	37,36	46,51	24%	95.795	119.152	23.376	2
		Euro S	241	241	9%	16,13	46,51	180%	3.082	11.130	7.308	19
AADE .		Ears 6	0	0	9%	16,33	46,61	283%	1	3	2	29
Light Duty		Gosoline total	6.118	6.118	8%	229,35	198,57	-13%	1,463,061	1,214,776	-188.305	-1
Vehicles		ha Ena	3.995	3.995	9%	425.09	386,79	-28%	1,698,290	1.226,602	472.598	-3
(LOVA)		Ears 1	4.787	4.787	9%	395,71	215,24	-45%	1.894.360	1.030.425	-863.525	-4
		Euro 2	10.818	10.818	9%	336,90	193,29	-43%	3.644.582	2.091.063	-1.953.530	4
	Diesel Oil	Euro 3	28.876	25.575	9%	541,53	150,54	-72%	15.637.249	4.346.870	-11.290.379	-73
	Presen Con	Euro 4	60.632	60.632	9%	490,62	89,26	-82%	30.039.914	5.429.811	-24.618.104	-8
		Euro S	6.689	6.609	9%	440,05	89,26	-80%	2.930.198	534.364	-2.336.836	-0
		Eart 6	0	0	9%	166,21	89,26	-43%	14	8	-6	-4
		Diesel oil total	115,967	115.967	6%	481,55	126,92	-74%	55,844,518	14,718,142	41.126.376	-1
		LDVs Total	122,085	122,085	8%	468,92	130,51	-72%	57.247.599	15,902,918	-41.314.681	-1
		pre-Euro	2.620	2,620	9%	1082,69	1019,78	-6%	2,836,109	2.671.331	-164.778	-
		Eurol	2.258	2,255	9%	752.91	751.40	0%	1,689,787	1.686.297	-3.410	
HARAH.		Eart I	9.074	9.074	9%	804.57	643.36	-20%	7.297.125	5,837,959	-1.459.156	-2
leavy Duty		Ears II	14.007	14.007	9%	633.96	457.38	-20%	9.425.890	6.009.064	-2.616.827	-2
Vehicles	Diesel Oil	Ears IV	6.131	6.131	9%	448.00	361,61	-82%	2 363 330	1.005.274	-498.864	-2
Suses		Eas V	13.396	13.396	9%	336.60	182,62	-60%	4.589.062	2.446.399	-2.062.663	- 0
		Ears VI	0	0	2%	370,00	186,66	0%		Ď	0	
		Buses Total	47,365	47,365	8%	592,65	448,99	-24%	28.071.221	21,296,323	-6.804.898	- 2
			8.044	8.044	9%	1038.67	753.88	-20%	8.355.423	6.144.933	-2.210.491	-3
		pre-Euro	4.384	4.384	15			-23%				-e -z
A3bH-		Eart				750,16	574,04		3.288.422	2.516.377	-772.844	
leavy Duty		Ears I	29.277	29.277	9%	817,97	520,31	-36%	23.947.723	15.233.223	-8.714.499	-3
Vehicles	Diesel Oil	Ears II	121.581	121.581	9%	635,56	372,68	-81%	77.271.520	45.312.437	-31.959.894	-4
Trucks &		Ears IV	99.430	58.430	9%	390,26	289,48	-36%	22.977.764	16.989.686	-6.068.019	-3
Lorries		Ears V	342.176	342,176	9%	279,30	162,00	-46%	95,589,479	62.019.687	43.549.793	-4
		Ewa VI	0	0	9%			0%		0		
		Trucks Total	563,891	563,891	6%	410,38	244,97	-40%	231,410,271	138,136,342	-93.273.529	4
		pr-Sur	7.389	7.389	9%	122,96	150,24	22%	968,588	1.110.176	201.550	2
LA3ble -		Ears 1	4.885	4.885	9%	124,72	165,25	35%	589.299	888.547	209.248	3
Motorised		Euro 2	3.544	3.546	9%	137,85	194,58	41%	488.582	689.683	201.051	4
Two	Gaspline	Ears 3	3.580	3.580	9%	39,59	194,58	392%	140.553	680.034	958 208	38
Wheelers		Ears 4	0	0	9%			0%	Ď.	0		
(M2WH)		Eura 6	0	0	9%			0%	ē .	0		
		M2Ws Total	19,289	19,289	8%	110,79	171,04	54%	2.137.002	3,299,162	1,162,160	- 5

adjustment\_de-a 6/11

				Activity Date	3	Imp	<b>Bod Emission</b>	Factor		NO, Emi	issions	
MFR Code	Fuel		current		difference	current	adjusted	difference	current	adjusted	adjustment	differen
				TA	in [%]		[kg/TJ]	in (%)		in Rul		in [5]
		ребиз	11,661	11.551	9%	607,72	636,39	-12%	7.006.041	6.189.786	436.266	-14
		Ears 1	47.487	47,467	9%	349.66	241,02	-31%	16.671.746	11,426,129	-6.145.617	-0
		Eura 2	22,761	22,761	2%	184.27	137.92	-25%	13,487,749	10.035.380	-3.372.369	4
		Earl 3	108.443	108.443	2%	63.89	72.62	14%	6.927.963	T.875.172	547.265	1
	Gassline		488.541	408.541	9%			-1%				
		Euro 4				45,39	45,13		18.541.861	18.436.716	-105.145	
		Euro 5	101.901	101.901	9%	18,61	45,13	143%	1.897.386	4.681.311	2.703.954	14
		Euro 6	282	282	9%	25,00	46,13	74%	7.336	12.736	5.399	i
1.A.3.b i .		Gasoline total	750.957	750.957	0%	85,73	70,00	.95.	64.379.984	50.577.329	5.802.765	
Passenger Cars		ba-Ens	1,487	1,487	9%	311,98	264,96	-19%	463.963	383.972	48.931	-
Cars		Ews 1	6,660	6,690	9%	297,79	296,44	-11%	1,980,364	1,771,797	-208.517	-
		Euro 2	33.967	33.967	9%	406,62	219.27	-45%	13.807.432	T.445.646	-6.361.787	4
	Diesel Oil	Earn 3	163,539	103.539	9%	564,02	178,63	-88%	58.398.037	18.454.837	-39.903.200	-4
	Diese Gr	Euro 4	234.943	234.943	8%	399,41	145,46	-62%	91,724,198	34.488.997	-57.315.201	4
		Euro 5	173.112	173,112	0%	434,89	145,46	-85%	75.284.364	25.383.375	-49.530.590	-4
		Euro 6	1.557	1.557	0%	259,94	146,46	-84%	464.664	220.006	-176.578	4
		Diesel oil tutal	595,245	595,245	0%	435,96	150,66	.64%	242.062.962	80,096,699	.153.966.203	
		PCs Total	1,386,282	1,386,262	65	234.61	112,29	.57%	305.042.096	146,673,997	.159,768,968	
		рэ Еиз	962	962	8%	632,00	645.95	2%	667,739	621.150	13.411	
		Ears 1	232	232	9%	863.24	383.22	45%	199.865	70.295	-129.661	4
		Euro 2	989	989	9%	271.16	195,74	-28%	268,194	193,556	-74.556	
		Euro 3	835	835	2%	89.38	98.33	10%	74.623	82.092	7.463	
	Gaseline	Euro 4	2.030	2.030	05	38.49	47.58	24%	78.195	96,601	18.445	
		Euro S	610	610	95	16.30	47,58	192%	9.941	29,011	19.003	+
				010	9%	15.37	47.68	210%	2.341	20.011		
A3bii .		Ears 6	0								4	21
Light Duty		Gasoline total	5,657	5,657	6%	218,93	193,15	.12%	1.238.520	1.092.662	-145.859	
Vehicles		ha-Ena	3.291	3.291	2%	434.46	306,79	-29%	1.368.754	982.093	-376.661	4
(LOVA)		Euro 1	3,656	3.656	9%	395,34	215,24	-46%	1.445.580	787.034	-858.526	-
		Euro 2	8.479	8.479	8%	336,40	193,39	-43%	2.852.325	1,639,772	-1.212.553	-
	Diesel Oil	Euro 3	23,785	23,765	0%	550,53	150,44	-73%	13.050.281	3.586.082	-9.454.139	4
	Present On	Euro 4	59.485	59.485	0%	494,22	89,85	-82%	29.368.676	5.337.395	-24.021.403	-4
		Euro S	15.964	15.964	0%	442,70	89,85	-80%	7.040.461	1.420.906	-6.611.955	-4
		Euro 6	1	1	8%	191,94	89,86	-41%	122	72	-68	-4
		Diesel oil total	114,350	114,350	6%	481,91	120,17	.79%	55.106.382	13,741,354	-41.365.828	
		LDVs Total	120,008	120,008	8%	468,51	123,61	-74%	96.344.963	14.834.016	-41.510.887	
		pre-Euro	1,326	1,326	9%	1083.46	1019.46	4%	1.410.646	1.352.253	-58.382	
		Eurol	1,248	1,245	9%	727.34	751.15	3%	907.476	937,184	29.708	
		Earl	7.765	7.765	05	763.46	643.34	-10%	6.085.891	4.98T.478	-1.050.413	-
LA.3.b III - leavy Duty		Euro II	16.483	16.463	9%	629.94	457,51	-21%	9.073.197	6.589.744	-2.403.453	
Vehicle:	Diesel Oil	Ears IV	6.301	6.301	95	458.10	361.05	-23%	2.442.179	1.076.777	-666 402	- 1
Buses					2%	347.84						
		Ears V	20.762	20.762			182,99	-47%	7.219.663	3.797.467	-3.421.096	4
		Ewa M	73	73	9%	64.62	182,99	296%	3.961	13.296	9.334	21
		Buses Total	90.962	90.962	0%	533,22	384,33	-28%	27,141,913	19,563,298	-3.578.704	- 4
		pre-Euro	6.922	6.922	9%	1036,95	758,82	-21%	7.177.543	5.252.345	-1.525.198	-
		Eart	3.630	3.630	9%	749,70	570,57	-24%	2.721.326	2.071.111	-650.215	- 4
A3bH-		Ears I	23.577	23.577	0%	818,27	596,43	-31%	19.292.253	12.175.855	-7.116.398	-3
leavy Duty Vehicle:	Diesel Oil	Ears II	96.726	96.726	9%	634,66	370,21	-42%	61.367.137	35,000,665	-25.578.472	4
Trucks &	Peter Off	Ears IV	90.690	90.590	9%	396,60	299,44	-27%	19.992.680	14.580.977	-6.411.723	-4
Lorries		Ears V	485,981	405,981	9%	291,24	162,32	-46%	114,149,866	61.826.677	-62.324.278	-4
		Ears VI	2.300	2.300	9%			0%	108.467	360.323	341.856	22
		Trucks Total	589,585	589,585	8%	381,33	224,00	-41%	224.829,180	132,064,753	-52,764,428	-
		pre-Euro	6,790	6,790	9%	122.76	151,00	23%	822.538	1.011.920	189.381	- 7
		Euro 1	4.306	4.305	9%	124.61	171.30	30%	536,615	738,050	201.435	3
Motorised		Euro 2	3.267	3.267	95	136.22	194.95	43%	445.0ET	636.853	191.846	-
Two	Gassline	Eura 3	3.994	3.994	95	39.66	194.95	382%	150,306	770.616	620.230	31
Wheelers	- Cartonia	Euro d	3.996	2.996	9%	20,00	100,00	0%		0	620.230	21
(MQWH)			0	0	2%			0%		0		
		Eura 6		18,268	9% 9%	107,43	173,28	61%	1,962,546	3,165,439	1,202,893	
		M2Ws Total	18,268									

				estivity Date			ed Emission			NO <sub>3</sub> Emi		
FR Code	Fuel		current		difference	CURTERS	adjusted	difference	CUITERS	adjusted	adjustment	different
			in []	LIJ.	in [N]		kg/TJ[]	in [5]		in [kg]		in [5]
		ребиз	11.490	11,490	9%	610,22	619,36	-15%	7.011.641	6.96T.452	-1.044.009	-1
		Ears 1	37,743	37,743	8%	363,78	241,88	-32%	13.362.986	9.129.405	-4.223.901	-0.
		Eura 2	62,680	62,600	0%	189.93	139.33	-21%	11,889,922	8.722.244	-3.167.678	4
		Euro 3	97,792	97,792	9%	66.38	73.19	10%	6.481.618	T.156,920	665.303	1
	Gassine	Euro 4	397.911	397,911	8%	47,22	46.52	-1%	18,790,345	18.589.937	-250.407	
		Euro 5	138.863	138.863	9%	18.50	46.52	150%	2.583.150	6,459,681	3,876,451	15
		Euro 6	2.7%	2.794	9%	25.99	46.52	79%	70.526	126.237	55.711	7
LARDI.		Gasoline total	749,114	749,114	0%	80.35	74,85	.2%	60,190,067	56,071,797	4.118.211	
assenger		ре-биз	1,389	1,389	2%	312.26	264,96	-10%	433.981	369,139	46.742	-1
Cars		Eura 1	5.625	5.625	8%	298.42	296,79	-11%	1,678,472	1,580,588	-177.884	
		Eura 2	28.437	28.437	8%	406.64	219.91	46%	11.563.522	6.253.531	-5.309.991	-
			92,795	92,795	2%	574.33	178,67	49%	53,294,996	16.579.373	-36,715,583	4
	Diesel Oil	Euro 3	222.583	222,583	15		149.27	-67% -67%				-0
		Euro 4				390,56			87.588.471	33,225,566	-54.372.905	
		Euro S	233,796	233,766	0%	435,42	149,27	-60%	101.767.275	34.884.768	-66.892.507	-4
		Ears 6	4.536	4.536	9%	258,53	149,27	-42%	1.177.151	677.046	-500.106	-4
		Diesel oil tutal	589,131	589,131	85	437,54	150,71	.64%	257.533.720	93,499,010	.164.834.718	Á
		PCs Total	1.338.245	1.338.245	8%	217,42	111,77	.53%	317.723.735	149,570,886	.168.152.928	- 4
		ha Ena	188	897	2%	630.81	645,95	2%	568.320	679.293	10.894	
		Ears 1	194	194	9%	863,50	386,27	-85%	167,261	59.326	-107.535	- 4
		Euro 2	836	836	9%	274,42	291,18	-21%	229.520	168,265	-61.258	- 4
		Euro 3	T84	T84	8%	92.66	101,70	10%	72,681	79.780	7.889	1
	Gaseline	Euro 4	1.889	1.599	9%	40.70	40.00	20%	77.284	92,633	15.549	- 2
		Euro S	966	966	9%	16.67	40.09	193%	16.107	47.240	31.161	+1
		Earl 6		4	9%	17.60	49.89	179%	36	72	46	17
Albii.		Gasoline total	5,578	5,578	8%	202.00	184,67	.9%	1.131.209	1.026,727	.104.412	-
ight Duty		рэ Еиз	2.754	2.754	9%	434,37	306,79	-20%	1.168.757	844.928	-323.828	- 4
Vehicles		Eart 1	2.948	2.948	2%	395.75	215.25	46%	1.166.702	634.586	-532.136	- 1
(LOV4)		Euro 2	6.982	5.9EZ	15	336.02			2.345.147	1,350,014	-896.133	
							193,38	-42%				4
	Diesel Oil	Euro 3	20.421	20.421	0%	568,12	150,38	-73%	11.437.995	3.070.913	-8.367.862	-7
		Ears 4	55.867	55.667	9%	497,72	90,45	-82%	27.775.440	5.048.416	-22.728.824	-4
		Euro S	29.004	29.024	9%	441,97	90,46	-80%	13.101.305	2.687.964	-10.403.361	4
		Eart 6	41	41	9%	161,28	90,46	-40%	6.169	3.680	-2.479	-4
		Diesel oil tutal	118,777	118,777	8%	499,60	114,90	-76%	57,003,533	13,650,488	43.433.845	-
		LDVs Total	124,354	124,354	6%	468,14	118,00	-79%	58.214.742	14,677,215	43.537.527	-
		ps-Euro	1,172	1.172	9%	1066,08	1019,23	4%	1.249.028	1.194.143	-54.885	
		Eart	1.054	1.054	9%	727,68	750,59	3%	765,620	791.181	24.561	
Albii.		Eart I	6.884	6.884	9%	764,07	643,48	-10%	5.334.965	4.378.271	-856.637	-1
eavy Duty		Ears II	13.167	13,107	9%	638.43	457.65	-21%	8.262.880	5.988.226	-2.364.575	- 4
Vehicles	Diesel Oil	Ears N	4.946	4.946	9%	468,55	361,71	-04%	2.270.061	1.739.786	-638.364	-4
Seses		Ears V	34,096	34,099	9%	368.08	183,46	-49%	9.435.583	4.420.743	-4.014.761	4
		Earl VI	637	637	2%	44.76	183.46	310%	34.047	98.672	74.626	31
		Buses Total	51,716	91,716	8%	509,54	360,06	-29%	26,350,969	18.620.843	-2.230.126	-
		pre-Euro	5.863	5.863	676	1035.72	737,38	-29%	6.072.170	4.322.868	-1.749.303	-
		Euri	2.985	2.985	15	748.27	568.27	-24%	2.175.845	1.680.969	-525.877	1
A3bH-			15.444	15.444	15		513.46	-31%	15.089.861			3
eavy Duty		Ears I				818,57				9.469.975	-5.619.806	4
Vehicles	Diesel Oil	Ears II	75.130	75.130	9%	630,53	367,30	-42%	47.587.440	27.587.760	-19.999.600	
Trucks &		Ears IV	42.791	42.791	9%	396,90	287,27	-27%	16.936.987	12.289.770	-4.647.837	-4
Lorries		Ears V	436,999	436,999	9%	281,70	152,66	-46%	123,101,334	66,796,496	-66.394.827	-
		Ewa VI	18.020	18.020	9%	60.67	152,65	201%	913.082	2.750.630	1.837.549	21
		Trucks Total	600,139	600,139	6%	353,06	297,90	-41%	211,887,531	124,788,469	-87,099,012	- 4
		ps-Euro	6.382	6.352	9%	123,07	151,79	23%	781,736	964,179	182.443	- 1
A3biv-		Euro 1	4.013	4.013	9%	125,11	173,15	38%	582.073	684.880	192.807	
Motorised		Euro 2	3.382	3.302	0%	132,24	195,58	40%	435,668	645.884	209.136	
Two	Gassine	Ears 3	4.562	4.582	9%	39,01	195,58	391%	181,610	882.176	710.966	31
Wheelers		Eart 4	0"	0	9%	100		0%	9	0		
(MQWH)		Eura 6	, or		8%			0%				
		M2Ws Total	18,229	18,229	674	104.34	175.38	481	1,962,088	3,197,038	1,294,951	-

adjustment\_de-a 7/11

			,	ictivity Dat	9	Impli	ed Emission	Factor		NO <sub>3</sub> Emi	ssions	
NFR Code	Fuel		current	adjusted	difference	current	adjusted	difference	Current	adjusted	adjustment	differen
			lin (f	LIJ.	in [N]	in p	(LT/gr	in [5]		in [kg]		in [5]
		ребиз	11.647	11.647	9%	612.37	644,11	-11%	7.132.688	6.307.464	-796 844	-4
		Eura 1	30.667	30.667	9%	368.77	243,90	-02%	11.002.246	7,480,541	-3.521.705	-3
		Eura 2	53.486	53,486	2%	194,58	140.31	-29%	10.514.477	T 684.432	-3.010.044	4
		Euro 3	87,374	87,374	8%	68.31	73.93	7%	6.055.588	6.459.797	404.210	
	Gasoline	Euro 4	387,759	367,759	2%	49.15	47.80	-3%	19.089.585	15.536.009	-523.557	
		Euro 5	171,278	171,278	0%	18.50	47.80	157%	3.183.292	8.187.581	5.004.209	15
		Euro 6	10.315	10.315	9%	25.97	47,00	84%	267.656	493,098	225 240	11
		Gasoline total	752,526	752,526	05	76.03	73.09	45	57,215,533	54,990,521	3,316,612	
1.A.3.b i .			1.341	1.341	8%	311,73	264,96	-10%	417.967	366,346	42 722	-
Passenger Cars		pr-Eur										
Care		Eura 1	4.992	4.992	9%	298.92	267,29	-11%	1,482,284	1.307,043	-155.161	
		Euro 2	23.934	23,934	9%	406,71	220.45	-46%	9,734,484	5.276.400	4.458.884	-
	Diesel Oil	Euro 3	82,749	82,749	9%	588,53	178,81	-89%	48.451.830	14.796.246	-33.655.585	4
		Euro 4	211,237	211,237	9%	397,27	151,77	-62%	83.917.680	32.059.973	-51.857.706	4
		Euro 5	285.811	285.811	9%	436,38	151,77	-65%	104.721.396	43.376.380	-81.343.896	4
		Euro 6	16.001	16,081	9%	259,34	151,77	-41%	4.170.580	2.440.686	-1.729.814	4
		Diesel oil tutal	636,045	626,045	8%	435,87	159,12	.625	272.076.061	99,613,892	.173.262.168	J
		PCs Total	1.328.521	1.328.571	6%	219,44	119,15	.53%	330.091.584	154,612,813	-175.478.281	
		рэ-Еиз	896	896	2%	634,74	646,96	2%	569.683	678.724	10.040	
		Eura 1	173	123	9%	868.27	389.96	-64%	150.074	53.576	-56.455	4
		Euro 2	T48	T48	2%	284.73	297.11	-21%	212.868	154,839	-58.829	
		Euro 3	771	771	1%	98.62	105.21	1%	75.982	81,070	5.078	-
	Gaseline	Euro 4	1.007	1.867	0%	43.47	50.15	15%	81.129	93.6%	12.479	
		Eura S	1,374	1,374	9%	17.11	50.15	193%	23,517	60.910	45.401	- 1
		Eura 6	17	17	9%	19.00	50.15	179%	312	870	667	1
AAbii .			5.845	5.845	676	199.34		3%	1,112,584	1.001.612	.86.572	- 11
Light Duty		Gosoline total					176,49					_
Vehicles		ha-Ena	2.637	2.637	9%	429.16	306,79	-21%	1.065.819	778.259	-287.558	- 4
(LOVA)		Euro 1	2.588	2.588	9%	390,62	215,25	-45%	987,136	539,808	-447.328	-
		Euro 2	6.087	6.007	9%	330,61	193,25	-42%	1.985.995	1.160.869	-825.126	-
	Diesel Oil	Euro 3	18.220	18.220	0%	571,75	150,58	-74%	10.417.076	2.742.056	-7.675.020	4
	Design On	Euro 4	52.361	52.361	9%	499,70	91,09	-82%	26.164.486	4.789.746	-21.394.748	4
		Euro S	46.749	46.749	9%	420,44	91,09	-79%	20.496.234	4.250.526	-16.237.709	- 4
		Ears 6	197	197	9%	161,18	91,09	-40%	29.929	17.974	-11.855	-4
		Diesel oil total	129,578	128,578	6%	475,56	110,96	-77%	61.146.575	14.267.237	-06.879.338	
		LDVs Total	134,423	134,423	8%	463,16	113,81	-29%	62.299.160	15,298,849	-96.960.311	-
		pre-Euro	984	584	9%	1089.48	1019.23	-5%	1.052.384	1.002.921	49.443	
		Eart	837	837	9%	725.12	750.98	3%	609.232	628,359	19,127	
MASA III		Eart I	5.588	5,586	0%	784.95	643.67	-10%	4.394.328	3,683,441	-790.857	
leavy Duty		Ears II	11,221	11.221	9%	631.20	450.38	-21%	7.082.748	5.143.528	-1.539.229	4
Vehicle:	Diesel Oil	Ears N	4.270	4.270	9%	461.10	361,79	-24%	1.972.610	1.584.970	-467.632	-
Buses		Ears V	22.042	22.042	9%	368,66	183,99	-40%	7.796.921	4.066.632	-3.671.309	-
		Ears VI	4.182	4 182	2%	42.78	183.99	300%	178.913	789.476	590.563	3
		Buses Total	49.143	49,143	976 9%	42.78	339,99	27%	23.017.115	16,718,234	4.308.881	
		pre-Euro	4.782	4.782	9%	1034,34	737,38	-29%	4.945.942	3.525,888	-1.420.134	-
A3bH-		Earn I	2.295	2.205	68	748,66	581,41	-25%	1.650.685	1.237.759	412.848	-
leavy Duty		Ears I	13.629	13.629	9%	817,90	510,38	-38%	11.145.889	6.965.738	4.191.131	
Vehicle:	Diesel Oil	Ears II	54.685	54.685	9%	610,52	364,41	-42%	34.589.677	19.927.835	-14.661.841	4
Trucks &		Ears IV	34.037	34.037	9%	396,37	286,34	-20%	13.491.199	9.711.896	-3.779.362	4
Lorries		Eura V	389.283	389.283	9%	202,92	163,06	-46%	110.112.792	59,589,043	-60.544.749	-
		Ewa VI	74.214	74.214	9%	60.06	153,05	189%	3.937.089	11.358.502	7.421.413	1
		Trucks Total	572,754	572,754	8%	314,05	196,05	-38%	179,874,133	112,285,582	-87.588.551	-
		pre-Care	6.185	6.185	9%	122.65	158,04	29%	796,185	974.388	218.182	
LA3ble -		Euro 1	3,837	3,837	1%	124.71	174.84	40%	478.514	670.859	192 346	
Motorised		Euro 2	3.365	3.365	0%	129.94	196,25	52%	433.874	680.378	226.504	
Two	Gassine	Eura 3	5.305	5.385	9%	39.53	196,25	396%	209.722	1.041.189	E31.467	31
Wheelers	-	Euro 4	0	0.000	2%	30,00	100,00	0%		0	8	
(MQWH)		Earl 6	0	0	9%			0%				
			18.623	18.623	6.00 6.00	100.59	179.34	795	1.878.294	3.346.794	1.68.69	
		M2Ws Total										

				ctivity Dat	0	Ireali	ed Emission	Factor		NO, Emi	ssions	
NFR Code	Fuel				difference	current	adjusted	difference	current	adjusted	adjustment	differen
			in (I		in INI		in/T.II	in (%)		in [kg]		in PM
		ребиз	11.380	11,390	8%	630.23	684.11	-14%	7.206.112	6.191.942	-1.014.169	
		Ears 1	34.112	36.112	8%	371.34	246.71	-34%	8.963.881	5.904.574	-3 029 229	
		Eura 2	42,925	42,925	8%	207.78	142,09	-32%	8.918.785	6.089.069	-2.819.646	
		Earl 3	72,871	72.871	8%	73.86	74.74	1%	5.381.361	5.446.237	64.887	
	Gassline	Euro 4	383,474	353.474	65	52.30	49.02	47%	18.485.637	17.326.221	-1.159.416	
		Euro 5	180.783	180,783	68	19.11	49.02	157%	3.454.481	8.881.456	5.406.575	1
		Euro 6	29.612	29.612	68	25.70	49.02	84%	790.701	1.451.403	650.793	
		Gasoline total	715.156	715,156	65	74.30	71,73	45	53,190,787	51,380,983	.1,889,805	
1.A.3.b i .		pre-Euro	1.282	1,282	8%	310,32	264,96	-10%	397.917	339,733	-1.889.805 -68.194	_
Passenger Cars		Fare 1		4.219	8%	299.14	267.84	10%			132 821	
Care			4.219			2010011			1.291,930	1.129.909		
		Euro 2	19.689	19.689	9%	407,00	220.36	-45%	8.013.587	4.338,719	-3.674.768	
	Diesel Oil	Euro 3	71.044	71.044	9%	595,01	179,04	-70%	42.271.648	12.719.962	-29.551.685	-
		Euro 4	192,410	192,410	8%	401,42	154,07	-62%	77.237.685	29.544.450	47.593.206	4
		Euro 5	304.346	304.346	0%	434,67	154,07	45%	132,290,483	45,880,424	-85.400.053	4
		Euro 6	52.576	52.576	8%	259,76	154,07	-41%	13.657.082	0.180.384	-6.956.778	-
		Diesel oil tutal	645,565	645,565	8%	426,19	159,88	.63%	275.130.233	183,163,501	.171.966.732	
		PCs Total	1.360.721	1.360.721	8%	241,28	113,52	.53%	329.321.020	154,464,484	.173.856.536	
		рэ Еиз	879	879	9%	664,37	646,96	-1%	675.300	567,977	-7.404	
		Ears 1	150	150	9%	895.63	311.90	45%	134,523	46.851	-87.672	
		Euro 2	629	629	9%	298.27	212.94	-29%	187,533	133,879	-53.854	-
		Euro 3	791	781	9%	105.50	198,62	3%	73,969	76,155	2.156	
	Gaseline	Euro 4	1.720	1.720	8%	47.06	51.30	9%	80.958	85,245	7.290	
		Euro S	1,620	1,630	9%	19.41	51.30	179%	29.012	83,086	53.274	1
		Euro 6	54	54	8%	19,71	61,30	174%	1.792	4.994	3.862	1
. ii 4.C.A.I		Gasoline total	5,790	5,793	65	197,19	172,00	.85	1.083.907	1,080,599	49.525	
Light Duty		po-Euro	2.323	2.323	8%	416.01	306,79	-26%	966.185	712.631	-253.654	-
Vehicles		Ears 1	2.106	2,106	8%	391.47	215.25	45%	824.270	453.227	-371.843	
(LOV4)		Euro 2	5.025	5.025	626	334.81	193.29	40%	1,632,296	971,296	-850.529	
		Euro 3	15.701	15.701	65	588.35	150,67	-74%	2.112.414	2.385.713	-6.746.701	
	Diesel Oil		47,480	47.480	65		91.74	-82%				
		Eart 4 Eart 5	62,116	62,116	65	406.10	91,74	-22%	23.782.396 27.090.214	4.345.295 5.680.295	-19.434.898 -21.392.809	
				636								
		Euro 6	636	135,386	65	164,01	91,74	-80%	97,750 63,585,643	14,647,490	-09.628 -09.897.853	-
		Diesel oil tutal	135,386			469,35	197,96	.77%				
		LDVs Total	141.098	141,098	6%	457,76	110,62	-76%	64.589.370	15,688,490	-48.560.881	
		pre-Euro	979	979	9%	1070,34	1019,23	-8%	1.048.312	988.255	-50.058	
		Eurol	747	747	8%	730,26	751,91	3%	545.471	581.636	16.168	
LABBII.		Euro I	5.211	5.211	8%	767,43	544,45	-10%	4.163.687	3.358.684	-746.883	
leavy Duty	Diesel Oil	Euro II	11.282	11.282	9%	633,00	450,67	-20%	7.141.732	5.174.909	-1.966 E22	4
Vehicles	Design on	Ears IV	4.586	4.586	9%	469,70	361,99	-25%	2.154.086	1.614.177	-639 829	4
Beses		Ears V	34.257	34.257	9%	368,77	184,68	-49%	9.727.069	4.477.641	-4.349.427	
		Ewe VI	6.224	6.224	9%	60,13	184,68	247%	277,642	964.225	696.694	3
		Buses Total	52.287	52.287	6%	458,56	327,99	-29%	23,997,817	17,149,448	4.848.379	-
		pre-Cara	4.319	4.319	9%	1034.69	737,38	-29%	4.468.571	3.184.428	-1.284.143	-
		Eurol	1.883	1.883	9%	748.71	583.48	-20%	1.387.291	1.025.551	-361.740	
LA3.bH -		Earl I	11.082	11.092	9%	817.98	587.98	-38%	9.072.840	5,633,460	-3.439.381	
leavy Duty		Ears II	43.481	43.481	8%	631.55	391.64	-43%	27.460.779	15.724.631	-11.736.147	
Vehicle:	Diesel Oil	Ears IV	29.233	29.233	8%	396,00	283.72	-20%	11.672.060	9.294.100	-3.279.769	
Trucks &		Ears V	329,726	329,726	8%	264,17	153,49	-40%	99,413,973	50.456.496	42.967.477	
Lorries		Ears VI	120.797	170.797	8%	67.49	153.49	167%	9.813.364	26.292.007	16 308 604	1
		Trucks Total	589,411	589,411	675	264.69	187,50	-30%	157,189,675	110,520,783	-46.668.913	
			5.744	5,744	8%	125.41	157,28	25%	720,441	983,470	183.628	
		pre-Euro										
LA3ble -		Ears 1	3.517	3.517	0%	127,40	176,22	38%	448.085	619.619	171.733	
Motorised		Euro 2	3.382	3.382	0%	127,36	196,93	95%	430.660	685.965	235.306	
Two	Gassline	Ears 3	5.011	5.011	0%	40,29	196,93	389%	234.126	1.164.415	910.209	3
(MDWs)		Euro 4	4	4	9%	16,96		-180%	69	904	736	10
femand		Ears 6	0	0	9%			0%		0		
		M2Ws Total	18,459	18,459	65	99.32	180,65	82%	1.833.382	3.334.472	1.501.090	

adjustment\_de-a 8/11

				Activity Dat	3	Imp	Sed Emission	Factor		NO, Emi	ssions	
MFR Code	Fuel		current		difference	current	adjusted	difference	current	adjusted	adjustment	different
			in [		in [5]		[ka/TJ]	in (%)		in [kg]		in [%]
		ребиз	11.782	11.792	9%	634.76	644,11	-14%	7.479.914	6.410.967	-1.867.967	-4
		Eura 1	20.270	20.270	8%	372.26	241,68	-05%	7,545,483	4.090.000	-2 646 596	-0
		Euro 2	36.062	36.062	8%	212.73	143,11	-33%	7.671.681	5.160.88T	-2 510 993	
		Ears 3	63,039	63,039	8%	78,17	75.50	-1%	4.801.482	4,759,259	42.233	-
	Gassline	Euro 4	334.413	334.413	9%	53.74	50.17	-1%	17.909.904	16,777,445	-1.192.460	
		Euro 5	183,374	183,374	05	19.09	50.17	163%	3.500.746	9,199,834	5,000,000	11
		Euro 6	66.332	66.332	05	25.67	50.17	80%	1.768.917	3.327.850	1.558.533	10
			715,272	715,272	05	79.93	70.65	85	50,736,967	50,535,049	201.918	-
1.A.3.b i .		Gasoline total										_
Passenger Cars		be-Ens	1.290	1.290	9%	308,76	264,96	-14%	396.262	339.173	-54.009	-1
Cars		Eura 1	3,749	3,749	9%	299.38	299,66	-10%	1,122,449	1,011,026	-111.425	-1
		Euro 2	16,584	16,584	9%	407,19	221,40	-45%	6.720.132	3.663.964	-3.066.168	4
	Diesel Oil	Euro 3	61,398	61,398	9%	602,50	179,24	-70%	36.991.999	11.085.049	-25.586.550	-1
		Euro 4	175.840	175,840	9%	405,76	156,24	-61%	71.352.220	27.474.006	43.878.214	- 4
		Euro 5	299.684	299.684	0%	433,94	156,24	-64%	130.032.044	45.819.229	-83.212.815	- 4
		Euro 6	116.634	116,634	9%	268,76	156,24	-40%	30.427.585	10.232.785	-12:194.778	4
		Diesel oil tutal	675,119	675,119	8%	410,36	160,76	.61%	277.041.660	188,535,230	.168.506.438	á
		PCs Total	1,390,391	1,390,391	65	215,75	114,41	.51%	327,778,627	159,070,380	.168.708.347	
		pra Eura	910	910	8%	662,79	645.95	:1%	593,793	687 663	4.235	
		Eura 1	136	136	8%	900.31	312.78	-85%	122,126	42,425	-79.700	4
		Euro 2	540	540	9%	300.39	217,84	-21%	162.311	117,797	-84.604	- 4
		Euro 3	680	680	2%	108.43	111.37	3%	70.432	72.731	2.299	
	Gaseline	Eura 4	1.684	1.684	1%	49.06	52.36	T%.	75.714	84.003	5.209	
		Euro S	1.724	1.724	9%	19.02	52.36	164%	36.157	90.258	56.100	10
		Eura 6	363	363	2%	18,66	62.36	181%	6.764	10.992	12.228	11
Albii .												- 11
Light Duty		Gosoline total	5.926	5.906	0%	180,27	171,06	.5%	1.068.292	1.013.678	-54.614	
Vehicles		ha-Ena	2,169	2.169	2%	414,87	306,79	-26%	899.848	666.433	-234.415	4
(LOVA)		Euro 1	1,790	1,790	9%	391,09	215,25	-45%	700.169	385.371	-314.798	4
		Euro 2	4.223	4.223	9%	323,43	193,31	-40%	1.365.984	816.452	-549.542	4
	Diesel Oil	Euro 3	13.582	13.582	9%	588,91	150,77	-74%	8.084.323	2.049.233	-5.955.090	- 4
	Design On	Euro 4	43.141	43,141	0%	504,46	92,40	-82%	21.763.989	3.986.141	-17.777.768	-4
		Euro S	78.231	78.231	0%	434,10	92,40	-79%	32.223.263	6.050.790	-25.364.903	-7
		Euro 6	4.901	4.901	0%	163,49	92,40	-40%	795.285	454.676	-300 609	-4
		Diesel oil tutal	144,068	144,068	6%	414,12	185,62	-77%	65,712,732	15,216,007	-50.496.726	
		LDVs Total	149,994	149,994	6%	445,23	108,29	-76%	66,781,025	16.229.684	-50.551.340	
		pre-Euro	891	891	9%	1070.81	1019.23	-5%	954,197	988.234	45.963	
		Eurol	583	583	65	731.38	752.57	3%	433,675	446,236	12,550	
		Earl	4.375	4.375	0%	768.25	645.00	-10%	3.448.614	2.822.021	-626.534	-
LA.3.b III - leavy Duty		Euro II	10.333	10.333	9%	632.67	450,91	-21%	6.539.364	4.741.827	-1.797.536	4
Vehicles	Diesel Oil	Ears IV	4.449	4.449	95	475.90	362.29	-36%	2.117.210	1,596,881	-650.330	4
Buses		Eas V	34.390	24.390	25	366,30	186,22	-49%	8.935.974	4.617.617	-4.418.457	- 1
			9.126	9.126	2%	62.79	186,22	195%	673.066	1,680,481	1.117.336	19
		Ears VI			P%							
		Buses Total	54,157	54,157	919	494,73	388,24	-27%	23.002.109	16,683,117	4.308.992	-
		pre-Euro	3.933	3.933	9%	1004,01	737,38	-29%	4.067.249	2.900.319	-1.166.530	-4
		Eart	1.585	1.585	9%	748,96	587,92	-32%	1.163.462	789.813	-373.589	-3
A36H-		Ears I	8.876	8.676	9%	817,75	585,52	-30%	7.258.045	4.485.828	-2.771.218	-3
leavy Duty Vehicle:	Diesel Oil	Ears II	36.167	36.167	9%	630,01	360,66	-43%	21.553.288	12.251.155	-9.302.133	4
Trucks &	Design Off	Ears IV	34.297	26.267	9%	396,94	291,06	-29%	9.640.354	6.945.501	-2.794.893	-4
Lorries		Ears V	299,736	269,736	9%	267,22	163,92	-46%	74,600,233	39.978.610	-04.621.623	- 4
		Ewe VI	261,460	261,460	9%	61,77	153,92	149%	16.149.288	40.244.036	24.094.748	14
		Trucks Total	594,013	594,013	8%	225,31	180,97	-20%	134.431.899	107,496,252	-26.535.637	-
		pre-Euro	5.543	5.543	9%	125.59	155,78	24%	696.072	883.299	167.218	-
		Euro 1	3,300	3.300	9%	127.11	177.29	39%	427,113	585,796	168.502	3
Motorised		Euro 2	3.375	3.375	95	125.04	197,68	50%	421.951	66T.078	345.127	
Motorised Two:	Gassine	Euro 3	6.443	6.443	95	40.30	197,68	391%	259.627	1.273.571	1,013,543	31
Wheelers	Catomie	Euro d	6463	6.663	2%	17,47	197,68	1031%	1.134	12/3.571	11,696	100
(MQWs)		Earl 6	0		2%	17,63	107,68	1001%		0.00	11.696	100
		M2Ws Total	18,785	18,785	674	96,14	181,66	895.	1.885.897	3,452,476	1.606.579	-

			- 1	Activity Date	9	Impl	led Emission	Factor		NO <sub>3</sub> Emi	ssions	
FR Code	Fuel		current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	
			in [	D)	in [N]	in	kg/TJ]	in [5]		in [kg]		in [5]
		ребиз	12.292	12.292	9%	636,73	644,11	-14%	7.914.267	6.689.107	-1.126.108	-4
		Ears 1	17,449	17,449	9%	372,99	241,68	-35%	6.609.311	4.217,044	-2:291.267	-0
		Euro 2	30.435	30.435	0%	217,43	141,75	-35%	6.617,570	4.314.140	-2.303.430	-3
	Gaspine	Euro 3	54.271	54,271	9%	78,40	76.27	-3%	4.254.938	4.139.376	-115.562	
	Casaine	Euro 4	315.085	315,086	9%	54.96	51.26	-1%	17.316.320	16.151.861	-1.164.468	
		Euro 5	180.245	180.245	0%	19,17	51,26	167%	3.485.382	9.239.816	5.784.513	11
		Euro 6	116,791	114,791	9%	26,66	51,26	92%	3.060.226	5.884.372	2.824.146	1
LARDI.		Gasoline total	734,571	734,571	8%	67,66	69,88	35.	49.026.074	50,634,714	1.607.848	
'assenger		ребиз	1.310	1.310	9%	306,09	264,96	-13%	480.983	347.020	-63.893	
Cars		Eura 1	3.390	3,390	0%	299,17	271,67	-9%	1,002,298	910,182	492,116	
		Euro 2	13,798	13,788	9%	407,17	222,40	-45%	5.614,130	3,066,393	-2.547.736	
		Euro 3	52,128	52,128	9%	608.05	179.65	-70%	31,696,478	9.384,798	-22.331.769	
	Diesel Gil	Euro 4	157,547	157,547	9%	410.10	158.34	-61%	64,733,465	24.983.323	-39.740.142	4
		Euro 5	283,480	283,480	9%	423.99	158.34	-63%	120,157,686	44,873,190	-75.254.455	
		Euro 6	184,790	184,760	9%	262.61	150.34	-40%	48.521.163	29,255,985	-19.265.258	
		Diesel oil tutal	696,592	696,582	0%	390.65	161,95	.59%	272.126.091	112,010,721	.159.315.379	
		PCs Total	1.491.162	1.691.162	0%	225.98	115.01	.00%	321,152,965	163,445,435	.157,207,530	
		ре-Еиз	940	940	2%	661,61	645,95	-1%	612.240	686,918	-6.322	
		Ears 1	124	134	2%	906.23	312,78	45%	112.083	38.682	-73.401	
		Euro 2	485	485	9%	302,12	221.62	-21%	140.344	182,950	-37.394	
		Euro 3	586	586	9%	110.57	115.36	4%	65,965	65.812	2.857	
	Gaseline	Euro 4	1.476	1,476	0%	50.72	53.38	5%	74.877	78.8%	3.538	
		Euro S	1,660	1,660	9%	21.73	53.30	140%	36,240	89,034	52.706	1
		Euro 6	919	919	9%	19.59	63,38	187%	17.062	49,000	21.548	-
Albii.		Gasoline total	6.186	6.186	8%	171,15	167,18	3%	1.059,799	1.034.211	-24.508	
ight Duty		pro-Euro	2.067	2.067	9%	413,41	306,79	-36%	850,499	631,163	-219.336	-
Vehicles		Ears 1	1.538	1.538	2%	390.47	215.25	45%	600.716	331,158	-269.558	
(LOV4)		Euro 2	3,580	3,580	65	321.26	193,04	40%	1.143.793	687.293	-458.501	
		Euro 3	11.664	11.664	15	595.08	150,79	-75%	5.940.879	1.758.747	-8.182.132	
	Diesel Oil	Euro 4	39.050	39.050	65	506,78	93.09	-82%	19.789.647	3,635,035	-16.154.612	
		Euro S	75.789	75.799	68	412.66	93.09	-70%	12,790,966	T.054.945	-26,736,811	
		Earl 6	19,626	19.626	9%	161.71	93.09	-39%	2.977.439	1.826.876	-1.150.964	
		Diesel oil total	153,284	153,284	676	424.66	103,09	-76%	65.093.930	15,925,216	49.168.714	
		LDVs Total	199,470	199.420	65	414,83	106,35	-74%	66.152,729	16,959,427	-49.193.302	
					9%	1073.33	1019.23	-74%		750,425	-39.834	
		pre-Euro	736 411	736 411	15		752.57		790.259			
		Eart	3,325	3,325	PS -	731,97 787,91	752,57 645,79	3% -10%	380.684 2.630.067	389.062 2.14T.450	8.459 -472.606	
A3bii.		Ears I										
eavy Duty	Diesel Oil	Ears II	8.678	8.678	0%	634,33	459,12	-21%	5.478.480	3.984.005	-1.494.395	
Vehicle: Bases		Ears IV	3.023	3.023	9%	474,07	362,49	-30%	1.012.300	1.347.680	-464.700	4
		Ears V	21,913	21,913	9%	363,92	186,84	-49%	7.937.976	4.063.686	-3.894.291	
		Ewa VI	14,696	14,596	0%	68.62	185,84	219%	864.215	2,712,680	1.858.375	2
		Buses Total	53,382	53,382	6%	379,80	296,71	-21%	19,793,901	15.384.828	-4.489.013	
		pre-Euro	3.686	3,686	9%	1034,40	737,35	-29%	3.730.272	2.689.016	-1.071.256	
A3bH-		Eart	1.311	1.311	9%	748,03	465,38	-31%	980.842	614.151	-366.000	
eavy Duty		Ears I	7.087	7.087	9%	817,66	583,45	-38%	5.794.876	3.568.026	-2.226.851	4
Vehicle:	Diesel Oil	Ears II	36.086	26.006	9%	630,17	366,72	-66%	16.942.661	9.563.641	-7.378.821	-
Trucks &		Ears IV	30.082	20.002	9%	397,77	279,34	-30%	7.996.414	6.58T.466	-2.368.568	-
Lorries		Ears V	264,365	264,365	9%	299,16	154,36	-47%	69.280.789	31.636.367	-07.746.342	
		Eara VI	335.065	335.065	9%	65.62	154,35	135%	21,985,366	51.718.641	29.733.275	1
		Trucks Total	588,263	598.263	8%	195,02	175,92	-10%	116,671,141	105,246,508	-11.424.833	
		pre-Euro	5.336	5.336	9%	125,91	157,19	25%	671.888	838.799	166.881	
A3bir -		Ears 1	3.257	3.257	9%	125,39	177,86	41%	411.617	579.244	167.627	
Motorised		Euro 2	3.396	3.396	0%	122,55	198,33	62%	415.290	673.548	257.348	
Two	Gassine	Ears 3	6.741	6.741	9%	40,22	190,33	383%	271.167	1.336.966	1.065.849	3
Wheelers		Ears 4	430	430	9%	19,29	199,33	986%	7.062	86.270	77.408	9
(MWW)		Ears 6	0	0	9%	0,00		0%		0		
		M2Ws Total	19,160	19,160	8%	92,83	183,39	98%	1,778,674	3,513,797	1,235,114	
							135,23		525,549,410			

adjustment\_de-a 9/11

			- 1	Activity Date		Impli	ed Emission I	Factor		NO, Emir	ssions	
NFR Code	Fuel		current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	different
			in [	T.I	in [N]		[LT/gr	in [5]		in [kg]		in [5]
		ребиз	12.219	12.219	8%	637,59	644,11	-19%	7.790.966	6.649.721	-1.142.234	-1
		Ews 1	14,362	14,362	8%	374,24	241,68	-05%	6.371,161	3.469.643	-1.902.518	-0
		Ews 2	24.295	24.295	8%	221.07	111,06	-50%	5.360.977	2,688,163	-2.862.814	-6
	Gassine	Euro 3	43.642	43.642	8%	80,15	76,96	4%	3.497.781	3.358.617	-139.164	
	-	Euro 4	276,736	278,738	626	55,58	52,30	-1%	15.683.488	14.578.755	-1.824.743	
		Euro 5	185,830	165,530	0%	19,35	52,30	170%	3.226.282	8.725.668	5.497.456	17
		Euro 6	159.041	159.041	0%	0,00	52,30	0%	4.190.422	8.318.250	4.127.828	- 1
1A3bi.		Gasoline total	689.027	699.027	0%	64,42	60,36	65.	45.032.996	47.786.857	2,753,820	
Passenger Cars		heems	1,363	1.363	9%	300,66	264,96	-13%	395.466	346.173	-60.293	-1
Cars		Ears 1	2.849	2.849	9%	299, 17	272,06	-9%	962,432	776.166	-77.277	
		Euro 2	10.784	10.784	9%	407,20	222,87	45%	4.391.393	2,483,536	-1.987.858	-
	Diesel Oil	Earn 3	40.796	40.796	9%	612,49	180,15	-21%	24.932.029	T.333.241	-17.558.788	-1
		Euro 4	130.534	130.534	9%	414,71	160,48	41%	54,133,837	20.937.329	-33.196.508	4
		Euro S Euro 6	251.212 220.685	251.212 226.685	95 95	415,25 254,67	190,48	-61% -31%	184.585.785 58.284.140	40.293.731 36.680.440	-64.273.836 -21.603.708	4
		Diesel oil tutal	666,074	229.085 606.034	05	371,66	163,38	-31%	247,596,063	100,760,604	.130.207.450	
		PCs Total	1,365,101	1,365,101	60	214.34	114,68	.60	292,589,060	156,555,421	.136.033.639	
		pro-Euro	1.365.101	917	2%	914,34 660,53	645,95	-89%	596,069	682.662	-136.033.639 -4.207	
		Eura 1	188	188	2%	911.58	312,78	-86%	98.528	33.805	-84.723	4
		Euro 2	377	377	7%	303.64	224.45	-26%	114.682	84,713	-29,839	-
		Euro 3	511	511	1%	111.02	118.84	6%	57.282	60.739	3.537	,
	Gaseline	Euro 4	1.275	1.275	1%	52.02	54.36	4%	66.295	69.276	2.550	
		Euro S	1483	1483	2%	23.70	54.36	129%	35.160	80.626	45.465	12
		Eura 6	1.643	1.643	9%	18,69	64.36	192%	30,660	89.326	68.775	1
A3bii .		Gasoline total	6,315	6.315	8%	158.22	160,11	15.	999,199	1.011.138	11.839	
Light Duty		po-Euro	1.872	1.872	2%	411.97	306,79	-26%	771,307	674.412	-196.525	- 4
Vehicles		Eura 1	1,295	1,295	8%	389.84	215.25	45%	483,129	272.296	-229.842	
(LOV4)		Euro Z	2.842	2.842	9%	318.56	193,80	-39%	905.309	550,759	-354.540	-
		Euro 3	9.363	9.363	0%	559, 10	150.74	-75%	5.609.152	1.411.299	4.197.853	- 4
	Diesel Oil	Euro 4	33.232	33.232	0%	509.42	93.81	-82%	16,929,185	3.117.457	-13.811.648	4
		Euro S	66.283	66.283	8%	412.92	93.81	-70%	29.654.080	6.217.060	-22.477.828	4
		Euro 6	39.482	39.482	8%	168,79	93,81	-30%	6.941.616	3,686,228	-2.345.397	-1
		Diesel oil total	154,259	154,259	8%	384,71	102,69	-73%	59.344.525	15,840,310	-43.504.215	-
		LDVs Total	160,574	160,574	8%	375,80	194,94	-72%	60.343,725	16,851,449	-43.492.276	
		pre-Euro	547	547	9%	1078,16	1019.23	-8%	589.357	557,147	-32.210	
		Eurol	237	237	65	732.76	752.57	3%	173,678	176.368	4.830	
A3bii.		Eart I	2.270	2.270	0%	767,63	646,33	-10%	1.788.686	1.467.437	-321.249	-4
leavy Duty	Diesel Oil	Ears II	6.757	6.757	0%	630,09	459,32	-21%	4.262.724	3.103.402	-1.159.232	4
Vehicles	Desire On	Ears IV	3.043	3.043	8%	473,96	362,73	-25%	1.439.790	1.073.303	-366.467	4
Seses		Ears V	19,109	19,109	8%	362,42	186,37	-49%	6.663.266	3.376.046	-3.198.249	4
		Ewe VI	20,670	20,670	9%	56.89	186,37	228%	1,176,026	3.852.314	2.676.288	25
		Buses Total	91,634	51,634	8%	309,75	283,50	-19%	15,993,526	13,607,106	-2.386.429	
		pre-Care	3.252	3.252	9%	1004,82	737,38	-29%	3.375.369	2.485.071	-979.288	- 4
		Eart	1.094	1.094	65	747,82	465,38	-31%	818.052	512.376	-305.674	
A3bH-		Ears I	5.544	5.544	0%	817,44	581,68	-39%	4.532.198	2.781.510	-1.750.658	
leavy Duty Vehicle:	Diesel Oil	Ears II	20.583	20.583	9%	629,54	363,66	-44%	12.957.751	T.27T.279	-6.600.472	4
Trucks &	District Co.	Ears IV	15.912	15.912	9%	398,09	276,23	-31%	6.334.421	4.395.424	-1.908.997	4
Lorries		Ears V	196,983	196,983	9%	292,40	154,68	-47%	45,964,163	24.293.309	-21.620.843	4
		Ewa VI	381,799	381,799	9%	68,76	154,68	126%	26.251.482	59.065.898	32.804.495	12
		Trucks Total	585,186	585,186	0%	171,18	172,10	1%	100.173.337	180,710,869	537.532	
		pre-Euro	4.940	4.940	9%	125,05	158,61	26%	622,686	783.451	160.795	- 7
LA3ble -		Ears 1	2.965	2.965	9%	125,14	177,79	41%	374.114	527.294	153.150	4
Motorised		Euro 2	3.221	3.221	9%	129,33	198,64	65%	387.586	639.833	252.237	
Two.	Gassline	Ears 3	6.241	6.241	9%	40,24	190,64	394%	291.126	1.239.680	908.962	31
(MDWs)		Ears 4	1.130	1.130	9%	29,41	199,64	973%	23.066	224.682	201.436	6
(seems)		Eara 6	0	0	9%	0,00		0%		0		
		M2Ws Total	18.497	18.497	8%	89,66	184,61	1065	1,458,558	3,454,757	1,756,209	1
A.J.b. Road			2,180,993		05	215.85	133,49	385	470,750,206	291,139,612	.179.618.593	- 1

			- 1	Activity Date	9	Impl	led Emission	Factor		NO, Emi	ssions	
NFR Code	Fuel		current	adjusted	difference	CURTOR	adjusted	difference	current	adjusted	adjustment	different
			in [	U)	in [5]	in J	kp/TJ]	in [5]		in [kg]		in [5]
		ребиз	13.669	13,669	0%	638,58	644,11	-15%	9.664.621	7.382.698	-1.291.822	-4
		Eura 1	12.427	12,427	8%	379,32	241,68	-36%	4,701,480	3.083.383	-1,698,896	-0
		Ews 2	20.086	20,086	8%	225,58	92.60	-69%	4,531,070	1,858,018	-2.673.052	-5
	Gassline	Euro 3	36.216	38.216	0%	82.22	78.12	-8%	2.977.840	2,829,166	-148.673	
	Gassine	Euro 4	255,220	295,220	9%	57.04	53.29	-7%	14.588.295	13.589.621	-858.584	
		Euro 5	100.537	100.537	0%	19,77	53,29	170%	3.173.728	8.584.356	5.380.628	17
		Euro 6	206,636	206.636	0%	25,63	53,29	180%	5.295.099	11.010.782	5.715.603	10
14301.		Gasoline total	764,691	764,691	0%	62,30	60,45	10%	43,901,941	40,230,025	4.336.004	1
Passenger		ребиз	2.736	2.736	9%	330,76	264,96	-21%	913,198	724.923	-198.275	-2
Cars		Ews 1	2.565	2.565	9%	299.00	272,06	-9%	766,913	687,786	49.127	
		Ews 2	8.891	8.891	9%	407,19	229,16	-44%	3.620.296	2.037.460	-1.582.826	4
	Diesel Oil	Euro 3	33.019	33.019	9%	615,11	180,42	-71%	20.310.125	5.95T.483	-14.352.723	-1
	Diese Us	Euro 4	111.335	111.335	9%	419,97	162,44	-81%	45,568,585	18.085.228	-28.583.457	- 4
		Euro 5	231,794	231,794	0%	410,37	162,44	-60%	95.117.643	37.680.997	-57.456.645	-4
		Euro 6	273.511	273.511	0%	227,30	162,44	-29%	62.169.238	44.429.104	-17.740 054	-2
		Diesel oil tutal	663,041	663,041	8%	345,81	165,67	.52%	229,566,088	109,582,982	.119.903.106	
		PCs Total	1.368.532	1.368.532	6%	199,83	115,32	.425	273.468.029	157.821.007	.115.647.822	- 4
		рэ Еиз	926	926	9%	649,69	646,96	15%	601,469	587,992	-3.468	
		Ears 1	97	97	0%	915.28	312,78	-86%	88.963	30.396	-58.957	4
		Euro 2	316	316	9%	304,63	224,45	-26%	96,158	70.848	-25.310	- 4
	Gasaline	Euro 3	447	447	0%	112,68	121,47	8%	50.355	54.293	3.525	
	Caseme	Euro 4	1.126	1.106	0%	53,00	55,26	4%	59.652	62,199	2.547	
		Euro S	1.361	1.361	0%	25,34	55,26	110%	34.240	74.680	40.432	11
		Eart 6	2.420	2.420	8%	18,76	66,36	196%	45.393	133.753	98.358	11
. ii d.C.A.		Gasoline total	6,683	6,683	6%	146,08	153,35	5%	976.219	1.024.150	47.931	
Light Duty Vehicles		po Euro	1,764	1,764	2%	410.96	306,79	-25%	725,111	641.316	-183.7%	- 4
(LOVA)		Ears 1	1.079	1,079	9%	389,52	215,25	-45%	420.295	232.255	-188.836	-
from the	184)	Euro 2	2.334	2.334	9%	315,98	194,79	-38%	737,682	454,650	-282.912	- 4
	Diesel Oil	Euro 3	7,649	7,549	0%	601,11	150,70	-75%	4.587.943	1.152.711	-3.445.233	- 4
	Preser On	Euro 4	26.711	26,711	0%	512,28	94,57	-82%	14.765.365	2.715.154	-11.993.154	4
		Euro S	50.716	58.716	9%	434,30	94,57	-70%	25.499.580	5.552.420	-19.547.152	- 4
		Euro 6	99.931	98.931	9%	146,18	94,67	-36%	9.614.686	6.672.892	-3.641.614	-
		Diesel oil total	159,183	159,183	8%	347,42	101,90	-71%	55.303.335	16.221.445	-39.081.090	
		LDVs Total	165,866	165,866	8%	339,31	193,97	-89%	96.279.554	17,245,596	-39.833.958	
		pre-Euro	489	489	9%	1080,20	1019,23	-8%	586.867	478.258	-28.609	
		Eurol	147	147	9%	736,37	752,57	2%	165.212	110.583	2.381	
AREA.		Eart I	1.611	1.611	0%	760,47	646,77	-10%	1.271.445	1.041.621	-229 824	
leavy Duty	Diesel Oil	Ears II	5.789	5.789	9%	631,65	459,55	-21%	3.686.361	2.623.779	-902.572	4
Vehicles	Desir On	Ears IV	2.747	2.747	9%	473,92	362,64	-26%	1.362.061	969.413	-332 648	4
Seses		Ears V	17,120	17,120	9%	362,91	186,84	-49%	6.213.176	3.199.791	-3.014.394	-
		Ewe VI	25,135	25,135	9%	60.43	186,84	289%	1,618,901	4.686.133	3.177.232	2
		Buses Total	52,939	52,939	8%	274,41	247,81	-10%	14/527/012	13,118,578	-1.408.434	
		pre-Euro	3.140	3.140	9%	1034,96	737,35	-29%	3.250.020	2.315.443	-534.577	- 4
		Eurol	909	909	9%	747,60	465,39	-31%	724,240	453.754	-279.456	4
A3.bH -		Eart I	4.565	4.565	0%	817,42	581,04	-39%	3.734.343	2.295.967	-1.445.376	4
leavy Duty Vehicle:	Diesel Oil	Ears II	16.377	16.377	0%	629,94	361,68	-64%	10.300.323	5.756.580	4.543.743	4
Trucks &	Diesei Ori	Ears IV	13.127	13,127	9%	398,86	273,43	-31%	6.236.679	3.689.330	-1.646.349	-
Lorries		Ears V	126,233	126,233	9%	296,13	154,92	-40%	36,960,689	19,481,449	17,669,168	-
		Ewe VI	432,498	432,498	9%	72.08	154,92	115%	31,175,496	67,003,863	35.828.357	1
		Trucks Total	595,913	595,913	8%	150,35	199,17	10%	91,380,790	100,889,376	9.428.676	
		pre-Euro	4.813	4.813	9%	125,69	164,73	31%	684.987	792,771	187.714	
A3bir-		Ears 1	2.835	2.835	0%	125,39	177,29	41%	355.455	582.569	147.113	
Motorised		Euro 2	3.094	3.094	9%	119,33	190,86	67%	309.224	615.317	346.893	
Two	Gaspine	Ears 3	6.082	6.002	9%	40,03	190,06	367%	240.284	1.193.617	963.333	3
Wheelers		Ears 4	2.086	2.005	9%	21,69	199,96	917%	43.489	399.667	366.179	
(M2WH)		Earl 6	0"	0	8%	0.00		0%		0		
		M2Ws Total	18,750	18,750	8%	86,05	186,83	117%	1.613.450	3,582,541	1.889.491	1
								-				

# **REVISION OF ADJUSTMENT PROPOSAL COMPARED TO SUBMISSIONS 2014 to 2019**

adjustment de-a 10/11

	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	
Adjustment 2021 (proposal)										
Change against Adjustment 2020										

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 of the *Handbook Emission Factors for Road Transport* now available in version 4.1 > 9 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 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

bibliography: 1: 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: 2: 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: 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: IIASA, 1999: Amann, M.; Bertok, I.; Cofala, I.; Gyarfas, 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'Environment Direction de la Prévention des Pollutions et des Risgues 20, avenue de Ségur75302 Paris 07 SP, April 1999 -URL: https://iiasa.ac.at/web/home/research/resea 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. (2019a): 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 Datenund Rechenmodells: Energieverbrauch und Schadstoffemissionen des motorisierten Verkehrs in Deutschland 1960-2035, sowie TREMOD, im Auftrag des Umweltbundesamtes, Heidelberg & Berlin, 2019. : 7 : UBA, 2018: CLRTAP submission 2018, Dessau, 2018: 8: ECE/EB.AIR/113/Add.1, 2012: Report of the Executive Body on its thirty-first session, Decision 2012/12 on 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/ECE EB.AIR 113 Add.1 ENG 1 .pdf: 9: 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?cgiprox y\_skip=1, 5 August 2014 : 10 : CEIP, 2014b: Centre on Emission Inventories and Projections (CEIP): ECE/EB.AIR/GE.1/2014/10: Review of adjustment applications 2014; URL:

http://www.ceip.at/fileadmin/inhalte/emep/pdf/2015/ece.eb.air.ge.1.2014.10.edited.ae\_formatting\_accepted.ko.pdf, 5 August 2014 : 11 : CEIP, 2015a: Centre on Emission Inventories and Projections (CEIP): CEIP/Adjustment RR/2015/Germany: Review of the 2015 Adjustment Application by Germany, URL:

adjustment de-a 11/11

https://webdab01.umweltbundesamt.at/download/adjustments2015/Germany2015-adj.pdf?cgiproxy\_skip=1, September 2015 : 12 : 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 : 13 : 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 : 14 : 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: 15: 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: 16: CEIP, 2018a: Centre on Emission Inventories and Projections (CEIP): 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: 17: 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: 18: 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=2ahUKEwj0y67pi5foAhWB 16QKHfpYDlgQFjAAegQlAhAB&url=https%3A%2F%2Fwww.hbefa.net%2Fd%2Fdocuments%2FHBEFA33\_Hintergrundbericht.pdf&usg=AOvVaw2sOF884KtccVyWLldt1ClZ - Dokumentation, Bern, 2017.: 19: 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. bibliography

<sup>1) (</sup>bibcite 4)

<sup>2) (</sup>bibcite 1)

<sup>3) (</sup>bibcite 3)

<sup>4) (</sup>bibcite 2)

<sup>&</sup>lt;sup>5)</sup> (bibcite 4)

<sup>6) (</sup>bibcite 5)

<sup>7) (</sup>bibcite 6)

<sup>8) (</sup>bibcite 18)

<sup>9) (</sup>bibcite 19)