adjustment de-a 1/12

# **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 $_{\rm x}$  (IIASA, 1999)  $^{\rm 1}$ ). The over-all 2010 national emission ceiling (NEC) for NO $_{\rm x}$  was set to 1,081 kt. When negotiating the EU NEC Directive two years later, Germany agreed to reduce its NO $_{\rm x}$  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) <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)  $^{5}$ . Here, the impacts of changing model versions and activity data in the context of meeting the EU NEC Directive ceiling commitments were examined for four European countries including Germany. Unfortunately, this comparison study was carried out within a COPERT environment. Therefore, the results gained cannot be transferred to the German TREMOD environment on a one-to-one level but nonetheless allow a highly illustrative insight in the reasons for not meeting the set ceiling. The study modeled fuel consumption and  $NO_x$  emissions for four selected countries (Germany, France, Netherlands and Belgium) and found higher  $NO_x$  emissions were estimated for the road transport sector than originally modelled by the RAINS model of IIASA (which underpinned the setting of 2010 ceilings). For Germany, this study shows that with the same activity data set (LIFE+

adjustment de-a 2/12

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<sub>x</sub> ceilings for road transport is due to:

#### Changes in methodology and emission factors

As these technologically driven changes (as reflected in the <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 $^1$ 

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

$$EM_{adjustment} = AD_{current} * EF_{current} - AD_{current} * EF_{original}$$

$$= AD_{current} * (EF_{current} - EF_{original})$$

$$= EM_{current} - EM_{current} * EM_{curr$$

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**

adjustment de-a 3/12

#### 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 TREMOD, the following comparison has to be carried out between the oldest version of TREMOD still available and the version as applied for the current inventory submission (2021).

Unfortunately, the oldest TREMOD version available for such comparison is TREMOD 3.1 from 2002  $^{6}$ , including the following set of NO<sub>x</sub> emission factors:

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

However, as this version includes the 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, 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., 2021a) <sup>7)</sup>.

Description of the updated methodology used

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

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

and

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

Comparison of emission estimates made using the original and updated methodologies

The values of NO<sub>x</sub> emissions presented in the table below are estimated with:

• TREMOD 3.1 model equations as initial methodology

and,

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

adjustment de-a 4/12

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, 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\_de-a 5/12

Adjustment o	werview fo	ryear	2010 to 201	9								
				ctivity Data			Emission			NO, Emi		
NFR Code	Fuel	Year	current in [	adjusted o	difference in [%]	current a in [kg		difference in [%]	current	adjusted in [kg]	adjustment	difference 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	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	-19%	1.618.432	1.358.328	260.104	-16%
1.A.3.bii	diesel oil		113,450	113,450	0%	476,34	134,96	-72%	54.040.533	15.311.584	38.728.949 6.747.534	-72%
1.A.3.bii 1.A.3.bii	diesel oil diesel oil		48.844 566.741	48.044 566.741	0% 0%	623,00 445,67	482,55 271,83	-23% -39%	29.931.266 253.148.243	23.183.732 154.056.160	99.092.083	-23% -39%
1.A.3.biv	gassine		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		2010	2.079.608	2.079,608	0%			0%	645.965.162	349.851.206	296.113.956	-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.bi	diesel oil		553.564	553.564	0%	434,12	159,22	-63%	240.313.791	88.138.959	162,174,832	-63%
1.A.3.bii 1.A.3.bii	gasoline diesel oil		6.118 115.967	6.118 115.967	0%	229,36 481,55	198,57	-13% -74%	1.403.081 55.844.518	1.214.776	41.125.375	-13% -74%
1A3.bii	diesel oil		47.365	47.365	0%	692,66	448,99	-24%	28.071.221	21.266.323	6.884.898	-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 W	gaseline		19.289	19.289	0%	110,79	171,60	54%	2.137.002	3.299.162	-1.162.160	54%
1.A.3.b TOT		2011	2.100.883	2.100.883	0%			0%	632.365.736	331,625,655	300.740.081	-48%
1.A.3.bi	gaseline		750.957	750.957	0%	85,73	78,00	-9%	64.379.994	58.577.229 88.096.699	5.802.765	-9%
1.A.3.bii 1.A.3.bii	diesel oil gasoline		555.245 5.657	555.245 5.657	0% 0%	435,96 218,93	158,66 193,15	-64% -12%	1,238,520	1.092.662	153.966.203	-64% -12%
1A3.bii	diesel oil		114.350	114,350	0%	481,91	120,17	-75%	55.106.382	13.741.354	41.365.028	-75%
1A3bii	diesel oil		50.902	50.902	0%	533,22	384,33	-28%	27.141.913	19.963.208	7.578.704	-28%
1.A.3.b III	diesel oil		589,585	589,585	0%	381,33	224,00	-41%	224.829.180	132.064.753	92.764.428	-41%
1.A.3.b iv	gasoline		18.268	18.268	0%	107,43	173,28	61%	1.962.546	3.165.439	-1.202.893	61%
1.A.3.b TOT		2012	2.084.964	2.084,964	0%	92.00	24.05	2%		316.301.343	300.420.094	-49% -7%
1.A.3.bi 1.A.3.bi	gasoline diesel oil		749.114 589.131	749.114 589.131	0% 0%	80,35 437,14	74,85	-7% -64%	60.190.007 257.533.728	56.071.797 93.499.010	4.118.211	-7% -64%
1.A.3.bii	gasoline		5.578	5.578	0%	202,80	184,07	-95	1.131.209	1.026.727	184.482	-91%
1.A.3.bii	diesel oil		118.777	118.777	0%	480,60	114,93	-76%	57.083.533	13,650,488	43,433,045	-76%
1.A.3.b III	diesel oil		51,716	51,716	0%	509,54	360,06	-29%	26.350.969	18.620.843	7.730.126	-29%
1.A.3.bii	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.b W	gasoline	2042	18.229	18.229	0%	194,34	175,38	68%	1.902.088	3.197.038	-1.294.951	68%
1.A.3.b TOT 1.A.3.b i	gasoline	2013	2.132.683 752.526	2.132.683 752.526	0%	76.03	73.09	4%	616,079,063 57,215,533	54.998.921	2.216.612	-50% -4%
1A3.bi	diesel oil		626.045	626.045	0%	435,87	159,12	-63%	272.876.061	99.613.892	173.262.169	-63%
1.A.3.bii	gaseline		5.845	5.845	0%	190,34	176,49	-7%	1.112.584	1.031.612	80.972	-7%
1.A.3.bii	diesel oil		128,578	128.578	0%	475,56	110,96	-77%	61.146.575	14.267.237	46.879.338	-77%
1.A.3.bii	diesel oil		49.143	49.143	0%	468,37	339,99	-27%	23.017.115	16.708.234	6.308.881	-27%
1.A.3.b II	diesel oil		572.754 18.673	572.754 18.673	0%	314,05	196,05	-38% 78%	179.874.133 1.878.294	112.285.582 3.346.794	67.588.551 -1.468.499	-38% 78%
1.A.3.b TOT	gasoline	2014	2.153.563	2.153.563	0%	100,59	179,24	78% 0%	597.120.297	302,252,271	294,868,025	-49%
1.A.3.bi	gasoline	2014	715.156	715.156	0%	74,38	71,73	-4%	53.190.787	51.300.983	1.889.905	-4%
1.A.3.bi	diesel oil		645,565	645,595	0%	426,19	159,80	-63%	275.130.233	103.163.501	171.966.732	-63%
1.A.3.bii	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		135.306	135.306	0%	469,35	107,96	-77%	63.505.443	14.907.490	48.897.953	-77%
1.A.3.bii	diesel oil		52.287 589.411	52.287 589.411	0%	458,96	327,99 187,51	-29% -30%	23.997.817 157.109.676	17.149.448	6.848.370 46.668.973	-29% -30%
1.A.3.bii 1.A.3.biv	diesel oil gasoline		18.459	18,459	0%	266,69 99,32	100,65	82%	1.833.382	3.334.472	-1.501.090	82%
1.A.3.b TOT		2015	2.161.976	2.161.976	0%	99,06	100,000	0%		301,077.596	274.853.670	-48%
1.A.3.bi	gasoline		715.272	715.272	0%	70.93	70,65	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%		108.535.230	168.506.430	-61%
1.A.3.b ii	gasoline		5.926	5.926	0%	190,27	171,06	-5%	1.068.292	1.013.678	54.614	-5%
1.A.3.bii	diesel oil		144.068	144.068 54.157	0% 0%	456,12 424,73	105,62 308,24	-77% -27%	65.712.732 23.002.109	15.216.007	50.496.726 6.388.992	-77% -27%
1.A.3.bii 1.A.3.bii	diesel oil		54.157 594.013	594,013	0%	226,31	100,97	-20%	134.431.899		26.935.637	-20%
1.A.3.biv	gasoline		18.785	18.785	0%	96.14	181,66	89%	1.005.097	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%	272.126.091	112.810.721	159.315.370	-59%
1.A.3.bii 1.A.3.bii	gasoline discol of		6.186 153.284	6.186 153,284	0% 0%	171,15 424,66	167,18	-76%	1.058.799 65.093.930	1.034.211	24.588	-76%
1A3bii	diesel oil diesel oil		153.284 53.382	153.284 53.382	0%	370,80	286,71	-79%	19.793.901	15.304.828	4.489.073	-79%
1A3.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.b TOT	AL	2017	2.251.437	2.251,437	0%			0%		304.469.986	221.079.424	42%
1.A.3.b1	gasoline		699.027	699.027	0%	64,42	68,36	6%	45.032.996	47.786.817	-2.753.820	6%
1.A.3.bi	diesel oil		666.074	666.074	0%	371,66	163,30		247.556.063			-56%
1A3bii 1A3bii	gasoline diesel oil		6.315 154.259	6.315 154.259	0% 0%	158,22 384,71	160,11	.73%	999.199 59.344.525			1% -73%
1.A.3.b ii	diesel oil		51.634	51,634	0%	309,76	263,53		15.993.526			-15%
1A3bii	diesel oil		585.186	585,186	0%	171,18	172,10		100.173.337		-537.532	1%
1.A.3.b iv	gasoline		18.497	18.497	0%	89,66	184,61	100%	1.658.558	3.414.767	-1.756.209	100%
1.A.3.b TOT	AL.	2018	2.180.993		0%				470.758.206			-38%
1.A.3.bi	gasoline		704.691	704.691	0%	62,30	68,45	10%			-4.336.084	10%
1.A.3.b1	diesel oil		663.841	663,841 6,683	0%	345,01	165,07	-52% 5%	229.566.088 976.219		119.983.106 -47.931	-52% 5%
1.A.3.bii 1.A.3.bii	gasoline diesel oil		6.683 159.183	6.683 159,183	0% 0%	146,08 347,42	153,25		976.219 55.303.336			-71%
1A3.bii	diesel oil		52.939	52.939	0%	274,41	247,81		14.527.012			-10%
1.A.3.b ii	diesel oil		596.913	595.913	0%	153,36	169,17		91.380.700	100.809.376	-9.428.676	10%
1.A.3.b iv	gasoline		18.750	18.750	0%	86,05	186,83	117%				117%
1.A.3.b TOT	AL	2019	2.202.000	2.202,000	0%			0%	437.268.744	292,497,497	144.771.248	.33%

adjustment\_de-a 6/12

				ectivity Date			ed Emission			NO, Emi		
NFR Code	Fuel		current	adjusted	difference	current	adjusted	difference	Current	adjusted	adjustment	differen
			in (	D)	in [N]	in p	(LT/gr	in [5]		in [kg]		in [5]
		ребиз	13,686	13,686	8%	884.76	614.25	-12%	7.996.060	6.986.917	-969.143	-4
		Eura 1	76.661	26,661	8%	338.60	207,71	-30%	25,915,925	19,199,262	-3716.663	-0
		Eura 2	96.425	96.425	8%	172.06	135.03	-22%	16,590,020	13,020,026	-3 569 995	4
		Euro 3	133,139	133,139	8%	58.51	70.18	20%	7,790,384	9.343.433	1.553.129	2
	Gassline	Euro 4	444,991	444.991	25	42.27	42.19	0%	18,811,389	18,773,529	-37,859	
		Euro S	31,234	31,234	05	18.61	42.19	127%	581,142	1.317.737	736.595	12
		Euro 6	31,234	31,234	15	25.08	42.19	62%	201.142	1.511.131	7.36.230	14
										27 270 002	0.003.016	
1.A.3.b i .		Gasoline total	795,957	795.957	0%	97,55	84,99	.135	77.644.042	67,650,986	.9.993.935	- 4
Passenger Cars		he-Ens	1.916	1,916	9%	310,13	264,96	-10%	689.760	687.256	-96.506	-
Cars		Ews 1	10.338	10.338	9%	296.62	296,17	-11%	3.066.428	2.741.307	-325.121	-
		Euro 2	50.068	50.068	9%	406,90	219,19	-46%	20.372,795	10.974.210	-9.398.584	- 4
	Diesel Oil	Earn 3	134,025	134,025	8%	542,04	178,54	-61%	72.646.173	23.929.296	48,716,957	4
	Date of	Euro 4	279.154	279,154	9%	384,37	140,58	-63%	107.299.100	39.243.811	-68.055.349	4
		Euro 5	53.547	53.547	0%	434.70	140.58	-60%	23.276.735	T.52T.796	-15,749,829	- 4
		Euro 6	334	334	9%	267,62	140.58	-45%	86,044	46.953	-39.891	4
		Diesel oil tutal	529,380	529,380	0%	69.65	160,51	.635	227,341,096	84,970,461	.142.370.635	
		PCs Total	1.395.337	1.395.337	8%	210.12	115,16	.50%	304,985,938	152,621,367	.152.364.578	
		рэ Еиз	1,249	1,249	2%	627,09	646,96	3%	783.320	806.871	23.551	
		Eura 1	367	367	2%	861.05	297.39	45%	305,969	186,020	-200,950	4
		Euro 2	1.383	1.383	25	264.75	184,41	-30%	368.848		-111.531	3
			1,383	1.095	9%	82.47	90.63	10%		256.917	6.994	
	Gaseline	Euro 3							70.631	77.625		
		Euro 4	2.400	2.400	9%	36,32	44,50	24%	87.987	188.679	20.772	- 3
		Euro S	49	49	9%	15,34	44,90	193%	TSO	2.210	1.468	11
. HALLA		Eura 6	0	0	9%			0%		0		
Light Duty		Gasoline total	6.125	6.105	8%	255,87	214,75	-16%	1,618,432	1.358.328	-268.104	
Vehicles		ha-Ena	4.876	4,876	9%	425.99	306,79	-29%	2.077.142	1.495.903	-681.239	- 4
(LOVA)		Ears 1	5.989	5.989	8%	395.59	215.24	-45%	2.369.098	1.299,030	-1.080.069	4
from the		Euro 2	13,126	13,126	8%	336,76	193,10	-43%	4.420.360	2.534.731	-1.885.629	- 4
		Euro 3	33.249	33,249	0%	53/1.01	150.58	-72%	17.685.883	5,086,780	-12.649.123	- 4
	Diesel Oil	Euro 4	54,581	54,581	0%	491.42	80.00	-82%	26,621,636	4.540.722	-21.501.114	4
		Euro S	1,629	1,629	9%	427.50	80.00	-79%	696.296	164.434	-651,772	4
		Euro 6	0	0	8%	161.73	99.69	-42%	7	4	-3	4
		Diesel oil tutal	113,450	113,450	65	475.34	134,96	-72%	54.040.533	15,311,584	-38.728.949	
		LDVs Total	119,775	119,775	8%	464,70	139,18	-70%	55,658,966	16,649,913	-38.989.053	
			3.382	3.382	9%	1086.25	1029,78	-8%	3,674,087	3.452.644	-221.423	_
		pre-Euro										
		Euro I	2.826	2.826	9%	749,41	752,14	0%	2.117.871	2.125.585	7.723	
LA3bii.		Euro I	10.152	10.152	0%	801,86	643,47	-20%	8.140.119	6.532.213	-1.607.506	4
leavy Duty	Diesel Oil	Euro II	15.090	15.090	9%	630,22	457,25	-20%	10.066.776	T.289.299	-2.797.967	4
Vehicles	Design on	Ears IV	5.461	5.461	9%	448,63	361,86	-22%	2.450.016	1.921.527	-629.409	4
Buses		Ears V	10.326	10.325	9%	337,28	182,30	-46%	3.482.417	1.982.544	-1.999.873	-4
		Eara VI	0	0	8%			0%	t .	0		
		Buses Total	48,044	48,044	8%	623,00	482,55	-27%	29.931,296	23,183,732	-6.242.534	- 4
		pre-Euro	10.185	10,185	9%	1040.16	787,37	-25%	10.510.623	T.754.138	-2.758.485	-
		Eart	5,677	5,677	65	750.50	575.55	-23%	4.261.383	3.257.601	-993.792	-
LA3bH-		Euro I	38,588	38,588	95	817.62	524,79	-30%	31.525.526	20.234.619	-11,290,507	- 3
Seavy Duty		Ears II	158.903	158,933	05	636.20	374.48	41%	101.126.192	59.517.271	-41,608,921	
Vehicle:	Diesel Oil	Ears N	69.535	69.636	9%	390.94	290,02	-36%	27.183.067	20.166.636	-7.817.232	- 1
Trucks &		Ears V	283.934	283.934	2%	276,62	161,86	49%	79.540.643	43.116.897	-06,404,746	3
Lorries			281.904	280,904	2%	219,92	191,86	0%		43.119.887	109.424.748	-
		Ears VI				****						
		Trucks Total	566,741	566,741	0%	446,67	271,83	-39%	253,148,243	154,056,160	-99.092.083	-
		pre-Euro	7.973	7.973	9%	122,00	149,16	22%	972.721	1.189.303	216.582	- 1
LA3ble -		Euro 1	5.231	5.231	9%	123,77	165,74	34%	647.479	867.039	219.558	
Motorised		Euro 2	3.587	3.587	9%	941,96	194,21	30%	586.352	686.681	190.309	
Two	Gaspine	Ears 3	2.900	2.900	9%	39,11	194,21	397%	116,190	567.002	452.834	31
Wheelers		Euro d	0	0	9%			0%	8	0		
(MWW)		Ears 6	0	0	8%			0%		0		
		M2Ws Total	19,712	19,712	8%	113,68	168,43	48%	2.240,749	3.320.034	1.079.285	

				Activity Date			ed Emission			NO, Emi		
FR Code	Fuel		current		difference	current	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	-1
		Ears 1	61,979	61,979	9%	347,86	240,16	-31%	21,560,430	14.884.961	-6.675.479	-9
		Ews 2	87,083	87,083	8%	179.38	136,68	-24%	15.620.983	11.883,792	-3.727.191	-3
	Gassine	Euro 3	124,330	124,330	8%	81,64	71,52	16%	7.663.891	8.891.671	1.227.780	1
	Canana	Euro 4	442,185	442,185	626	43,84	43,68	0%	19.384.914	19.316.439	-68.4T6	
		Euro 5	85.057	65.057	0%	18,58	43,68	135%	1.227.381	2.885.636	1.658.255	13
		Euro 6	1	1	0%	25,00	43,68	60%	17	26	11	6
1A3b1.		Gasoline total	754,680	794,688	0%	92,09	81,61	.215	73,185,651	64.851.951	.8.333.900	
assenger		ребиз	1.711	1.711	9%	310,90	264,96	-15%	631,963	453.197	-78.606	-1
Cars		Ews 1	8.426	8.426	8%	297.32	295,86	-11%	2,605,115	2.239.997	-265.119	- 4
		Ews 2	42.514	42.514	8%	407.03	219.27	-46%	17.384.549	9.321,916	-7.982 E34	4
	Princet Park	Euro 3	121,429	121,429	8%	555,36	178,55	-88%	67,437,053	21.681.366	45.755.687	-4
	Diesel Oil	Euro 4	284.943	264.943	0%	388.08	143,46	-63%	102,817,801	38.009.755	-54.808.846	-8
		Euro 5	113,847	913,847	0%	435.12	143.46	-67%	49.536.968	16.332.974	-33 203 994	-4
		Euro 6	685	695	9%	258.59	143.46	-45%	180,582	99.754	-00.748	4
		Diesel oil tutal	553,564	553,564	05	434.12	159.32	.63%	240,313,791	88,138,959	.152.174.832	Á
		PCs Total	1,349,252	1,348,252	65	212.52	113,47	.51%	313,499,642	152,990,910	.160.508.732	
		pro-Euro	1.084	1.084	2%	629.26	645.95	3%	682.274	710.373	18.099	
		Eura 1	283	283	2%	858,74	384,47	45%	243.299	86,158	-157,132	4
		Euro 2	1.184	1.184	2%	268.66	191.66	-28%	310.529	223,189	-87 340	-
		Euro 3	TES	TES	25	85.97	95.39	11%	67.320	74.792	7.381	
	Gaseline	Euro 4	2.562	2.562	15	37.38	46.51	24%	95,795	119.162	23.376	
		Euro S	201	241	95	16.13	46.51	190%	3.082	11.190	7.308	- 11
		Eura 6	0	0	25	16.33	46.61	283%	1	3	2	21
Albii.		Gasoline total	6.118	6.118	65	229.35	198,57	.13%	1,460,081	1,214,776	.188.305	
ight Duty			3,995	3,995	9%	425.09	306,79	-29%	1,698,290	1,225,602	472.598	
Vehicles		po Euro	4.787	4.787	2%		215.24	-40%		1.030.425		- 4
(LOV4)		Ears 1				395,71			1.894.390		-863.525	
		Euro 2	10.818	10.818	9%	336,50	193,29	-43%	3.644.582	2.091.063	-1.553.530	4
	Diesel Oil	Euro 3	28.876	26.676	9%	541,53	150,54	-72%	15.637.249	4.346.870	-11.290.379	
		Euro 4	60.832	60.832	9%	490,82	89,26	-82%	30.039.914	5.429.811	-24.618.104	- 1
		Euro S	6.689	6.609	9%	440,05	89,26	-80%	2.930.190	534.364	-2.336.836	-1
		Ears 6	0		9%	166,21	89,26	-43%	14			-4
		Diesel oil tutal	115.967	115.967	8%	481,55	126,92	-74%	55.844.518	14,718,142	41.126.376	-
		LDVs Total	122,005	122,085	8%	468,52	130,61	-72%	57.247.599	15.902.918	-41.314.681	
		pre-Euro	2.620	2.620	9%	1082,69	1019,76	-8%	2.836.189	2.671.331	-164.718	
		Eurol	2.258	2.258	9%	752,91	751,40	0%	1.689.787	1.686.297	-3.410	
Albii.		Eart I	9.074	9.074	9%	804,17	643,36	-20%	7.297.125	5.837.959	-1.459.166	4
eavy Duty	Diesel Oil	Ears II	14.007	14.007	9%	633,16	457,38	-20%	9.425.890	6.889.064	-2.616.827	4
Vehicles		Ears IV	6.131	6.131	9%	448,00	361,81	-02%	2.363.330	1.005.274	-498 864	4
Buses		Eura V	13,396	13,396	9%	336,60	182,62	-46%	4,689,062	2.446.399	-2.062.663	4
		Ewe VI	0	0	9%			0%	0	0		
		Buses Total	47,365	47,365	8%	592,65	448,99	-24%	28.071.221	21.296.323	-6.804.898	- 4
		pre-Euro	8.044	8.044	9%	1008,67	783,88	-26%	8.355.423	6.144.903	-2.210.491	- 4
		Eurol	4.384	4.384	0%	750,96	574,04	-23%	3.288.422	2.516.377	-772.844	4
A3.bH -		Eart I	29.277	29.277	0%	817,97	520,31	-36%	23.947.723	15.233.223	-8.714.429	- 4
leavy Duty Vehicle:	Private (0.0)	Ears II	121.581	121.581	0%	635,56	372,68	-81%	77.271.520	45.312.437	-31.959.894	4
Trucks &	Diesel Oil	Ears IV	98.430	98.430	9%	390,26	289,48	-26%	22.977.764	16,989,685	-6.068.019	4
Lorries		Eura V	342,176	342,176	8%	279,30	162,00	-46%	95,589,479	52,019,687	-43.549.793	-
Lorina		Ewa VI	0	0	2%			0%	0	0		
		Trucks Total	563,891	563,891	8%	410.38	244,97	-40%	231,410,271	138.136.342	-83-273-529	-
		pre-Euro	7.389	7.389	8%	122.96	150.24	22%	968,588	1,110,178	201.580	- 1
		Euro 1	4.885	4.885	2%	124.72	165.25	35%	589.299	888.547	209.248	
Motorised		Euro 2	3.544	3.546	95	137.85	194,58	41%	488.582	689.683	201.851	
Two	Gaudine	Eura 3	3,580	3,590	85	39.59	194,58	392%	140.553	680,634	550 300	31
Wheelers		Earl 4	0	0	9%			0%		0		
(MQWs)		Earl 6	0	0	2%			0%		0		
		M2Ws Total	19,289	19,289	674	110.79	171,04	545	2.137.002	3,299,162	1.162.168	_

adjustment\_de-a 7/12

				Activity Date			ed Emission			NO <sub>3</sub> Emi		
NFR Code	Fuel		current	adjusted	difference	current	adjusted	difference	Current	adjusted	adjustment	differen
			in (	I.I	in [N]		[LT/gr	in [5]		in [kg]		in [%]
		ребиз	11,661	11,661	9%	607,72	636,39	-12%	7.036.041	6.189.786	-836.256	-
		Ears 1	47,487	47,467	8%	349,66	241,02	-31%	16,671,746	11,426,129	-6.145.617	
		Eura 2	72,761	72,761	0%	184,27	137,92	-25%	13,467,749	10.035,380	-3.372.369	4
		Euro 3	108.443	108,443	9%	63.89	72.62	14%	6.927.963	7.875.172	547.265	
	Gassine	Euro 4	488,541	408.541	9%	45.39	45.13	-1%	18,541,861	18,436,716	-105.145	
		Euro 5	101.901	101,961	0%	18.61	45.13	143%	1.897.386	4.681.311	2.703.954	1
		Euro 6	282	282	95	25.00	45.13	74%	7.338	12,736	5.399	
14301.		Gasoline total	750,957	750.957	0%	85,73	70,00	.95	64.379.984	50,577,329	5.802.765	
Passenger		ребиз	1.487	1.487	2%	311.98	264.96	-10%	463.963	393,972	49.921	-
Cars		Eura 1	6.660	6.660	2%	297,79	296,44	-11%	1,980,364	1.771.797	-208.517	
		Euro 2	33.967	33.967	2%	406.62	219.27	45%	13.807.432	T.445.646	-6.361.787	
					274							
	Diesel Oil	Earn 3	163,539	103.539		564,02	178,63	-65%	58.398.037	18.454.837	-39.903.200	-
		Euro 4	234.943	234.943	9%	390,41	145,46	-62%	91,724,198	34.485.997	-57.315.201	-
		Euro 5	173.112	173,112	0%	434,89	145,45	-60%	75.284.364	25.383.375	49 530 590	4
		Euro 6	1.557	1.557	9%	259,84	146,46	-81%	484.664	228.086	-176.578	-
		Diesel oil tutal	555,245	555,245	0%	435,96	150,66	.665	242.062.982	80.096.699	.153.966.203	
		PCs Total	1.306.202	1,306,262	6%	234,61	112,29	-52%	306.442.896	146,673,927	-159,768,968	
		pa-Eura	962	962	9%	632,00	646,96	2%	667,739	621,150	13.411	
		Ears 1	232	232	8%	863.24	383.22	-85%	199.865	70.295	-129.661	
		Euro 2	989	989	9%	271.16	195,74	-28%	268,194	193,598	-T4.556	
		Euro 3	835	835	0%	89.38	98.33	10%	74.623	82,092	7.453	
	Gaseline	Euro 4	2.030	2.030	0%	38.49	47.58	24%	78.155	96,681	18.445	
		Euro S	610	610	9%	16.30	47.58	192%	9.941	29.011	19.003	1
		Euro 6	0	0	9%	15.37	47.68	210%	2	6	4	2
Albii.		Gasoline total	5.657	5,657	65	218.00	190,15	.10%	1,238,520	1.092.662	.165.859	-
Light Duty			3,291	3.291	2%	434.46	306,79	-20%	1.368.754	982.093	-376.661	_
Vehicles		ha-Ena	3.666	3.696	2%	395.34	215.24	45%	1,445,580	787.034	-858.526	
(LOVA)		Ears 1										
		Euro 2	8.479	8.479	9%	336,40	193,39	-43%	2.882.325	1.639.772	-1.212.553	
	Diesel Oil	Euro 3	23.785	23.765	9%	550,53	150,44	-73%	13.050.281	3.586.082	-9.454.129	
		Euro 4	59.485	59.485	9%	494,22	89,85	-82%	29.358.676	5.337.395	-24.021.403	
		Euro S	15.964	15.964	9%	442,70	89,85	-80%	7.040.461	1.420.986	-6.611.955	
		Euro 6	1	- 1	9%	191,94	89,86	-41%	122	72	-68	
		Diesel oil total	114,350	114,350	6%	481,91	120,17	-79%	55,106,382	13,741,354	-41.365.028	
		LDVs Total	120,088	120,008	8%	469,51	123,61	-74%	96.344.963	14.834.016	-41.510.887	
		pro-Euro	1,326	1.326	9%	1063.46	1019.45	4%	1,410,646	1.362.263	-58.382	
		Eurol	1,248	1.248	8%	727.34	751,15	3%	907.476	937.184	29.708	
A3bii.		Eart I	7,768	7,768	0%	763.45	643.34	-10%	6.085.891	4.987.478	-1.058.413	
many Duty		Euro II	16.403	16.483	0%	629.94	457,51	-21%	9.073.197	6.589.744	-2.403.453	
Vehicles	Diesel Oil	Ears IV	6.301	6.301	9%	453.50	361,66	-23%	2.442.179	1,076,777	-966,402	
Buses		Ears V	20.752	20.792	8%	347.94	182,99	-47%	7.219.663	3.797.467	-3.421.096	
		Ears VI	73	23	2%	64.62	182.99	236%	3.961	13.296	9.334	2
		Buses Total	50.902	50,962	674	510,22	384,33	-28%	27.141.913	19,543,298	2.578.704	-
		pro-Euro	6.922	6,922	9%	1036.95	758.82	-21%	7.177.543	5,252,345	-1.525.198	
					2% 2%		798,82 570,57	-21% -24%				
A3bH-		Eart	3.630	3.630		749,70			2.721.326	2.071.111	-650.215	
eavy Duty		Ears I	23.577	23.577	9%	818,27	595,43	-31%	19.292.253	12.175.855	-7.116.398	-
Vehicle:	Diesel Oil	Ears II	96.726	96.736	9%	634,66	370,21	-42%	61.367.137	35.080.665	-25.578.472	
Trucks &		Ears IV	90.690	90.690	9%	396,60	290,44	-21%	19.992.680	14.580.077	-6.411.723	4
Lorries		Ears V	405.981	405,981	9%	281,24	162,32	-46%	114,149,955	61.826.677	-62:324.278	
		Ewe VI	2.300	2.300	9%			0%	108.467	360.323	241.856	2
		Trucks Total	589,585	589,585	8%	381,33	224,00	-41%	224,829,180	132,064,753	-52,264,428	
		pre-Euro	6,790	6.790	9%	122,76	151,00	23%	822.538	1.011.920	189.381	
A3bir-		Ears 1	4.305	4.305	9%	124,61	171,30	38%	536,615	738.050	201.435	
Motorised		Euro 2	3.267	3.267	9%	136.22	194.95	43%	445.0ET	636.853	191.846	
Text	Gaspine	Euro 3	3.994	3.994	9%	39.66	194.95	392%	150.306	770.616	620.230	3
Wheelers		Eura 4	0	0	9%			0%		0		
(M2Ws)		Eura 6	0	o	2%			0%		0		
		M2Ws Total	18,268	18,268	8%	107,43	173,28	61%	1,962,546	3.165.439	1,202,893	

				ctivity Dat		lar of the	ed Emission	Factor		NO, Emi	enlane.	
NFR Code	Fuel		current	adjusted	difference	CURTERS	adjusted	difference	current	adjusted	adjustment	differen
			in [7		in [S]		[LT/gr	in [5]		in [kg]		in [%
		hegas	11.490	11,490	9%	610,22	619,36	-10%	7.011.641	6.967.452	-1.644.009	
		Ears 1	37,743	37,743	9%	363,78	241,88	-32%	13.362.986	9.129.405	4.223.501	
		Euro 2	62,600	62,600	9%	109.93	139.33	-21%	11,889,922	8.722.244	-3.167.678	
	Gassline	Euro 3	97,792	97,792	9%	66,38	73,19	10%	6.491.618	T.156.920	665.303	
		Euro 4	397.911 138.863	397.911	0% 0%	47,22 18,60	46,52 46,52	150%	18.790.345 2.583.150	15.589.937 6.459.681	-250.407 3.876.451	1
		Euro S Euro G	2.714	2.794	95	25,99	46,52	79%	70.536	126.237	55.711	1
14301.		Gasoline total	749,114	749,114	05	80,35	74,85	35	60.190.067	56,071,797	4.118.211	
Passenger		ребиз	1.389	1.389	2%	312.26	264,96	-10%	433.981	369.139	46.742	-
Cars		Ears 1	6.625	5.625	2%	298.42	296,79	-11%	1,678,472	1,580,588	-177.884	
		Euro 2	28.437	28.437	2%	406.64	219.91	45%	11.583.522	6.253.531	-6.309.991	
		Euro 3	92,795	92,795	9%	574.33	178.67	49%	53,294,996	16.579.373	-36.715.583	
	Diesel Oil	Euro 4	222.583	222.583	9%	390.55	149.27	-62%	87.558.471	33.225.566	-54.372.905	
		Euro 5	233,796	233,766	0%	435.42	149.27	-85%	101,787,275	34.884.758	-66 892 507	
		Euro 6	4.536	4.536	9%	258.53	149.27	-42%	1.177.151	677.046	-608.106	
		Diesel oil tutal	589,131	589,131	0%	437,14	150,71	.64%	257,533,720	93,499,010	.164.834.718	
		PCs Total	1,338,245	1.338.245	65	217.42	111,37	.53%	317,723,735	149,570,896	.168.152.828	
		pa Eura	897	997	2%	630.81	645,95	2%	568.320	679.293	10.894	
		Ears 1	194	194	0%	863.50	396.27	-85%	167,261	59,326	-107.535	
		Euro 2	836	836	9%	214.42	291.18	-21%	229.520	168.295	-61.258	-
		Euro 3	T84	T84	0%	52,66	101,70	10%	72,681	79.780	7.009	
	Gaseline	Ears 4	1.899	1.899	0%	40,70	45,89	20%	77.284	92.833	15.549	
		Euro S	966	966	9%	16,67	40,09	193%	16.107	47.240	31.161	1
		Ears 6	1	- 1	9%	17,60	49,89	179%	36	72	46	1
Albii.		Gosoline total	5,578	5,578	8%	202,80	184,07	-9%	1,131,269	1.026,727	-104.492	
Light Duty Vehicles		ребиз	2.754	2.754	9%	434,37	306,79	-29%	1,168,757	844.928	-323.828	- 4
(LOVA)		Ears 1	2.948	2.948	9%	395,75	215,25	-45%	1,166,782	634.586	-632.136	
		Euro 2	6.982	6.982	9%	336,02	193,35	-42%	2.345.147	1.380.014	-896.133	
	Diesel Oil	Euro 3	20.421	20.421	0%	568,12	150,38	-73%	11.437.995	3.070.913	-8.367.862	-
	Present Con	Ears 4	55.667	55.667	9%	497,72	90,46	-82%	27.775.440	5.048.416	-22.728.824	-
		Euro S	29.024	29.024	9%	441,97	90,46	-80%	13.181.325	2.687.964	-10.403.361	-
		Ears 6	41	41	9%	161,28	90,46	-40%	6.160	3,688	-2.479	
		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	8%	468,14	118,00	-79%	58.214.742	14,677,215	43.537.527	
		pre-Euro	1,172	1.172	9%	1066,08	1019,23	4%	1.249.028	1.194.143	-54.885	
		Euro I	1.054	1.084	9%	727,68	750,99	3%	766,620	791.181	24.551	
A3bii		Euro I	6.884	6.884	9%	764,07	643,48	-10%	5.334.988	4.378.271	-856 E37	
leavy Duty	Diesel Oil	Euro II	13.107	13.107	9%	630,43	457,65	-21%	8.262.680	5.988.226	-2.364.575	4
Vohicle: Bases		Ears IV	4.946	4.946	9%	468,55	361,71	-34%	2.278.061	1.739.796	-638.354	4
Culer		Ears V	34.096	24,096	9%	368,00	183,46	-49%	8.436.683	4.420.743	-4.014.761	
		Ewa VI	637	637	9%	44,76	183,46	310%	24,047	98.572	74.525	3
		Buses Total	91,716 5,863	51,796	0% 0%	509,54 1035,72	360,06 737,35	-29% -29%	26,350,969	18.620.843 4.322.868	-7.730.126 -1.749.303	-
		pe-Care Ears I	2.985	2,985	9%	749.27	568.27	-29% -24%	6.072.170 2.176.846	1.650.969	-1.748.303 -525.877	
A3bH-		Earl I	15.444	15.444	0%	818.57	513.46	-31%	15.089.861	9.469.975	-5.619.806	
leavy Duty		Eura II	75.130	75.130	95	630.53	367,33	-42%	47.587.440	27.587.790	-19.999.600	
Vehicle:	Diesel Oil	Eura IV	42.791	42.791	9%	396.90	287,27	-27%	16.936.007	12.289.770	-4 647 E37	
Trucks &		Eas V	436,999	436,999	2%	291.70	152.65	40%	123 101 334	66.786.496	-66 394 827	
Lorries		Eura VI	18.020	18.020	2%	60.67	152,65	201%	913.082	2,750,630	1.837.549	
		Trucks Total	600,139	600,139	0%	353.06	297,90	41%	211,887,531	124,788,469	-87,099,062	
		pročen	6.382	6.352	9%	123.07	151,79	23%	781.736	964,179	182.443	
		Euro 1	4.013	4.013	9%	125,11	173,15	38%	582.073	684.880	192.807	
Motorised		Euro 2	3.382	3.362	95	132.24	195.58	40%	436,668	645.884	209.136	
Two	Gaspline	Ears 3	4.562	4.562	9%	39,01	195,58	391%	181.610	882.176	710.565	3
Wheelers		Earl 4	0"	0	2%	20,01	T Mary and	0%		0	0	
(MQWN)		Earl 6	0"	ó	9%			016		0		
		M2Ws Total	18,229	18,229	8%	104.34	175,38	68%	1,962,088	3.197.008	1,294,951	

adjustment\_de-a 8/12

				Activity Date			ed Emission			NO <sub>3</sub> Emi		
MFR Code	Fuel		current	adjusted	difference	current	adjusted	difference	Current	adjusted	adjustment	differen
			in [	I.I	in [N]	in p	kg/TJ[]	in [5]		in [kg]		in [5]
		ребиз	11.647	11,647	9%	612,37	644,11	-11%	7.132,689	6.307.464	-796.844	-4
		Ears 1	30,667	30.667	8%	368,77	243,90	-32%	11,002,246	7,480,541	-3.521.706	- 4
		Eura 2	53,486	53,486	0%	196,58	140,31	-29%	10.514.477	T.584.432	-3.010.044	4
		Euro 3	87,374	87,374	9%	69.31	73.93	7%	6.055.588	6.459.797	404.218	
	Gassline	Euro 4	387,759	387,759	9%	49.15	47.80	-3%	19,059,585	15,535,009	-523.557	
		Euro 5	171,278	171,278	0%	18.59	47.80	157%	3.183.292	8.187.581	5.004.289	1
		Euro 6	10.315	10.315	95	25.97	4T.80	84%	267.050	493,098	225.240	
14301.		Gasoline total	752,526	752,526	0%	76,03	73,09	.45	57,215,533	54,990,921	2.216.612	
Passenger		ребиз	1.341	1.341	2%	311.73	264.96	-10%	417.967	366.246	40.720	-
Cars		Ears 1	4.992	4.992	2%	298.92	267.20	-11%	1,462,264	1.307.043	155.161	
		Euro 2	23.934	23.934	2%	406,71	220.45	45%	9,734,484	5,276,480	4.458.884	
			E2.749	82,749	25	588.53	178.81	49%	48.481.830	14.796.245	-33.855.585	
	Diesel Oil	Earn 3	211,237	211,237	25	397.27	151,77	-12% -12%	83.917.680	32,059,973	-51,857,706	
		Euro 4										
		Euro 5	285.811	285.811	0%	436,38	151,77	-65%	104.721.396	43.378.380	-81.343.896	
		Euro 6	15.081	16.001	9%	259,34	151,77	-41%	4.170.580	2.440.686	-1.729.014	-
		Diesel oil tutal	626.045	636.045	0%	415,87	159,12	.635	272.076.061	99,613,892	.173.262.169	
		PCs Total	1,328,521	1.378.571	6%	239,44	112,15	-53%	330.091.584	154,612,813	-175.478.281	
		ha ∈na	896	896	2%	634,74	645,95	2%	568,683	678.724	10.648	
		Ews 1	173	173	9%	868,27	389,96	-64%	150.074	53.575	-56.459	
		Euro 2	T48	T48	9%	284,73	297,11	-21%	212.868	154,839	-58.829	-
		Euro 3	771	771	0%	98.62	105.21	7%	75.982	81,070	5.078	
	Gaseline	Euro 4	1.067	1.567	0%	43.47	50.15	15%	81.139	93,616	12.479	
		Euro S	1.374	1.374	9%	17.91	50.15	193%	23.517	60.910	45.401	1
		Euro 6	17	17	9%	19.00	50.15	179%	312	870	967	1
Albii.		Gasoline total	5.845	5.845	8%	190.34	176,49	3%	1,112,584	1.001.612	.86.572	
Light Duty		рэ-Еиз	2,537	2,537	2%	429.16	306,79	-21%	1.065.819	778.259	-297.558	
Vehicles		Eura 1	2.588	2.588	2%	390.62	215.25	45%	987,136	539.808	-447.328	
(LOVA)												
		Euro 2	6.007	6.007	9%	330,61	193,25	-42%	1.985.995	1.160.869	-825.126	
	Diesel Oil	Euro 3	18.220	18.220	9%	571,75	150,58	-74%	10.417.076	2.742.056	-7.675.020	-
		Euro 4	52.361	52.361	9%	499,70	91,09	-82%	25.164.485	4.789.746	-21.394.748	
		Euro S	45.749	46.749	9%	428,64	91,09	-79%	20.496.234	4.250.526	-16.237.709	
		Euro 6	197	197	9%	161,18	91,09	-40%	29.929	17.974	-11.866	
		Diesel oil tutal	128,578	128,578	6%	475,56	110,96	-77%	61,146,575	14.267.237	46,879,338	
		LDVs Total	134.423	134,423	8%	463,16	113,81	-79%	62,259,160	15,298,849	-06.960.311	
		pro-Euro	984	984	9%	1069.48	1019.23	-8%	1.052.384	1.002.921	49.443	
		Euro I	837	837	8%	729,12	750,98	3%	689.232	628.359	19.127	
A3bii.		Eart I	5,586	5,586	0%	764.95	643.67	-10%	4.394.325	3,683,441	-790.857	
many Duty		Euro II	11.221	11,221	0%	631.20	450,38	-21%	7.082.748	5.143.528	-1.539.229	
Vehicles	Diesel Oil	Ears IV	4.270	4.270	9%	461.10	361.79	-34%	1,972,610	1,584,979	-467.630	
Buses		Ears V	22.042	22.042	8%	368,66	183,99	-40%	7.796.921	4.066.632	-3.671.309	
		Earl VI	4.182	4.182	2%	42.78	183,99	330%	178,913	769.476	590.563	
		Buses Total	49.143	49.143	P%	468.37	339.99	-27%	23.017.115	16,718,234	4.308.881	
		pro-Euro	47.782	4782	9%	1034.34	737.35	-29%	4.945.942	3,525,898	-1.429.134	
				2,285	2% 2%	748.66	581.41	-25%				
A3bH-		Eart	2.285						1.650.685	1.237.759	412.848	
eavy Duty		Ears I	13.629	13.629	9%	817,90	510,38	-35%	11.146.889	6.965.738	4.191.131	-
Vehicle:	Diesel Oil	Euro II	54.685	54.685	9%	610,52	364,41	-42%	34.589.677	19.927.835	-14.661.841	
Trucks &		Ears IV	34.037	34.037	9%	396,37	286,34	-20%	13.491.199	9.711.896	-3.779.262	4
Lorries		Ears V	389.283	389.263	9%	262,92	163,06	-46%	110,112,792	59.569.043	-60.544.749	
		Ewa VI	74.214	74.214	9%	60.06	153,05	189%	3.937,089	11.368.682	7.421.413	1
		Trucks Total	572,754	572,754	8%	314,05	196,05	-38%	129,824,133	112,285,582	-87.588.551	
		pre-Euro	6.185	6.185	9%	122,65	158,04	29%	756,185	974.388	218.182	
A3bir-		Euro 1	3,837	3.837	9%	124.71	174,84	40%	478.514	670.859	192.346	
Motorised		Euro 2	3.365	3.365	9%	129.94	196,25	52%	433.674	680.378	226.504	
Text	Gaspine	Ears 3	5.385	5.305	9%	39.53	196,25	396%	209.722	1.041.189	831.467	3
Wheelers		Earl 4	0	0	9%			0%		0		
(MQWH)		Eura 6	ő	o	2%			0%		0		
		M2Ws Total	18.623	18.623	8%	100,59	179,24	78%	1.878.294	3,346,794	1.468.499	

				estivity Dat		lar-W	ed Emission	Factor 1		NO, Emi	an long	
MFR Code	Fuel		current	adjusted	difference	current	adjusted	difference	current	adjusted	adjustment	differen
			in []		in [%]	620.23	(LT/gr	in [5]	7.206.112	in [kg] 6.191.962	-1.014.169	in [%
		pe-Eura Eura 1	11.380 34.112	11,380	2%	371.34	544,11 245,71	-14%	8.963.881	6.994.674	-1.010.109	
			42,925	42,925	2%	207,78	142,08	-32%	8.918.785	6.089.069	-2.819.646	
		Eura 2	72,871	72,871	2%	73.85	74.74	1%	5.381.351	5.446.237	64.887	
	Gassline	Ears 3 Ears 4	383,474	353,474	25	52,30	49.02	-6%	18.485.637	17.326.221	-1.159.416	
		Euro S	180.783	180,783	9%	19.11	49.02	157%	3.454.481	8.861.456	5.406.975	1
		Euro 6	29.612	29.612	9%	25,70	49,02	84%	790.701	1.451.493	650 793	1
14301.		Gasoline total	715,156	715.156	85	74,30	71,73	45	53,190,787	51,380,983	.1.889.805	
Passenger		рь-Еиз	1.292	1.282	2%	310.32	264,96	-10%	397.917	309.733	-68.194	-
Cars		Ears 1	4.219	4.219	2%	299.14	267,84	-10%	1261,930	1.129.909	-132 821	
		Euro 2	19.689	19.689	2%	407,00	220.36	40%	8.013.587	4.338,719	-3.674.788	
		Euro 3	71,044	71.044	2%	595.01	179.04	-70%	42,271,648	12,719,962	-29.551.685	
	Diesel Oil	Euro 4	192,410	192,410	9%	401.42	154.07	42%	77.237.685	29,544,450	47,593,206	
		Euro 5	384.346	364,346	0%	434.67	154.07	45%	132,290,453	45,880,424	-85,400,053	4
		Euro 6	52.576	52.576	9%	258.76	154.07	-41%	13.657.082	0.180.384	-6.956.778	-
		Diesel oil tutal	645,565	645,565	0%	496,19	159,88	.62%	275,130,233	183,163,501	.171.966.730	
		PCs Total	1.360.721	1,369,721	6%	241.26	113,52	.51%	339,331,030	154,464,484	.173.856.536	
		ре-Еиз	879	879	2%	664,37	645,96	-1%	675.380	567.977	-7.404	
		Euro 1	190	150	2%	895.63	311,93	-85%	134,523	46,851	-87.672	
		Euro 2	629	629	9%	298.27	212.54	-29%	187.533	133,879	-53.854	-
		Euro 3	781	701	0%	105.50	108.62	3%	73.969	76.155	2.156	
	Gaseline	Euro 4	1.720	1.720	0%	47,06	51,30	9%	80.958	85,245	7.290	
		Euro S	1.630	1.630	0%	10,41	51,30	179%	29.012	83.086	53.274	1
		Ears 6	54	54	9%	19,71	81,30	174%	1.792	4.994	3.862	1
Albii.		Gosoline total	5,793	5.793	8%	197,12	172,80	-8%	1.083.927	1.000.999	49.526	
Light Duty Vehicles		рэ-Еиз	2.323	2.323	9%	416,01	306,79	-26%	966,185	712.531	-253.654	- 4
(LOVA)		Ears 1	2.106	2,106	9%	391,47	215,25	-45%	834.270	453.227	-371.843	
(const)		Euro 2	5.025	5.025	9%	324,81	193,29	-40%	1.632.296	971.296	-650 529	
	Diesel Oil	Euro 3	15.701	15,701	0%	588,35	150,67	-74%	2.112.414	2.385.713	-6.746.701	-
	Present Con	Euro 4	47.480	47.480	9%	501,73	91,74	-82%	23.782.396	4.348.298	-19.434.098	-
		Euro S	62.116	62,116	9%	436,13	91,78	-79%	27.090.214	5.680.295	-21.392.009	-
		Ears 6	636	636	9%	164,01	91,74	-40%	97.798	59.230	-39.629	
		Diesel oil tutal	135,386	135,306	8%	469,35	107,96	-77%	63,505,443	14,687,490	48.897.953	
		LDVs Total	141,098	141,098	8%	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	988.256	-50.058	
		Euro I	747	747	9%	730,26	751,91	3%	545.471	561,636	16.165	
LA3bii.		Eart I	5.211	5.211	9%	767,43	544,45	-10%	4.103.687	3.388.684	-745.863	
leavy Duty	Diesel Oil	Euro II	11.282	11.282	9%	633,00	450,67	-20%	7.141.732	5.174.909	-1.966 B22	4
Vehicles		Ears IV	4.586	4.586	9%	460,70	361,99	-25%	2.154.086	1.614.177	-639 829	4
Seses		Ears V	34.257	34.267	9%	368,77	184,69	-49%	9.727.068	4.477.641	-4.249.427	
		Ewe VI	5.224	5.224	9%	60.19	184,68	247%	277.642	964.226	696.694	3
		Buses Total	52.287	52.267	0%	458,96	327,99	-29%	23,997,817	17,149,448	4.848.379	_
		pe-Euro	4.319	4.319	9%	1034,69	737,38	-29%	4.468.571	3.184.428	-1.284.143	
A3bH-		Eurol	1.883	1.853	0%	748,71	583,48	-20%	1.387.291	1.025.551	-361.748	
leavy Duty		Earl I	11.082	11.092 43.481	9% 9%	817,98	587,98	-38%	9.072.840	5.633.460	-3.439.381	
Vehicle:	Diesel Oil	Ears III	43.481	29.233	95	631,55 396,88	361,64 283,72	-43% -39%	27.460.779 11.672.060	15.724.631 0.294.100	-11.736.147 -3.279.768	
Trucks &		Ears V	329,726	29.233	2%	264.17	163,49	-40%	93,413,973	80.496.496 80.496.496	-3.278.768 -42.967.477	
Lorries		Ears VI	170,797	170,767	2% 2%	67,49	153,49	167%	9.813.364	26.292.007	16.388.684	1
		Trucks Total	589,411	589,411	976 9%	264.69	187,60	-30%	157,189,675	110,520,793	-86.668.973	
			5,744	5,744	9%	125.41	157,28	25%	720.441	983,470	-46.668.913 183.628	
		pre-Euro Euro I		3.517	8% 8%	125,41		38%	120.441 448.086	983.470 619.819	163.828 171.733	
LA3ble -		Euro 1 Euro 2	3.517	3.382	95	127,35	176,22	55%	430.660	685.965	235.306	
Motorised	Gaspine	Ears 3	5.011	5.011	95	40.29	196,93	389%	234.126	1.144.415	910.309	3
Two: Wheelers	Catomie	Ears d	5.011	5.011	9%	16,96	180,00	-180%	236.126	1.104.415	910 209 736	10
(MQWH)		Earl 6	0	0	9%	16,96		-180%		101	736	10
		M2Ws Total	18,459	18.459	9% 9%	99.32	180,65	82%	1.833.382	3.334.472	1.501.090	

adjustment\_de-a 9/12

				Activity Dat	3	Imp	led Emission	Factor		NO, Emi	ssions	
ER Code	Fuel		current		difference	current	adjusted	difference	current	adjusted	adjustment	differen
			in		in [5]		[kg/TJ]	in (%)		in Red		in [N
		ребиз	11.792	11.792	9%	634.76	644,11	-14%	7,479,914	6.410.967	-1.867.967	
		Ears 1	20.270	20.270	9%	372.26	241,68	-36%	7,545,483	4.090.000	-2 646 596	
		Eura 2	36.062	36.062	2%	212.73	143,11	-33%	7.671.681	5.160.89T	-2.510.693	
					274	38,17	75.50	-1%			42.233	
	Gaspline	Earn 3	83.039 334.413	63,039					4.801.452	4.759.259		
		Euro 4		334,413	9%	53,74	50,17	-1%	17.969.964	16,777,445	-1.192.468	
		Euro 5	183,374	183.374	9%	19,09	50,17	163%	3.500.T45	9.199.834	5.009.008	1
		Euro 6	66.332	66.332	9%	26,67	50,17	80%	1.768.917	3.327.850	1.558.533	-
1.A.3.b i .		Gasoline total	715,272	715,272	0%	70,93	70,65	85.	50.736.967	50,535,049	.201.918	
assenger		ребиз	1,290	1,290	9%	308,76	264,96	-14%	396.262	339.173	-56.009	
Cars		Eura 1	3,749	3,749	9%	299.38	289,66	-10%	1,122,449	1,011,026	-111.425	
		Ews 2	16,584	16,584	9%	407,19	221,40	-45%	6.720.132	3.663.964	-3.066.168	-
	Diesel Oil	Euro 3	61.388	61,398	9%	602,50	179,24	-70%	36.991.999	11.005.049	-25.586.550	-
	Diese Oil	Euro 4	175,840	175,840	8%	405,78	155.24	-61%	71.352.220	27.474.006	43.878.214	4
		Euro 5	299.684	299.684	0%	433.94	155,24	-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	-
		Diesel oil tutal	625,119	675,119	0%	410.36	160,76	.61%	277.041.660	100,535,230	.168.506.438	
		PCs Total	1,390,391	1,399,391	8%	215.75	114.41	.51%	397,778,697	159,070,280	.168.708.367	
		pre-Euro	910	910	2%	662,79	646.96	:1%	593.798	687 663	4.25	
		Eura 1	136	136	2%	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	-44.604	
			680	680	0%	908.43	111.57	3%	70.432	72.731	2.299	1
	Gaseline	Euro 3	1.684				52.36	7%				
		Euro 4		1.684	9%	49,06			78.714	84.003	5.209	
		Euro S	1.724	1.724	9%	19,02	52,36	164%	36.157	90.258	56.108	1
Albii .		Ears 6	363	363	9%	19,66	62,36	181%	6.764	19.992	12.226	1
John Duny		Gasoline total	5,926	5.906	8%	190,27	171,06	-5%	1.068.292	1.013.678	-54.614	
Vehicles		ha Ena	2.169	2.169	9%	414,87	386,79	-26%	899.848	686.433	-234.416	
(LOVA)		Euro 1	1,790	1,790	9%	391,09	215,25	-45%	700.169	385.371	-314.758	-
		Euro 2	4.223	4.223	9%	323,43	193,31	-40%	1.365.994	816.452	-549.542	-
	Diesel Oil	Euro 3	13.582	13.582	0%	588,91	150,77	-74%	8.004.323	2.049.233	-5.955.090	-
	Dieser On	Euro 4	43.141	43,141	0%	504.48	92,40	-82%	21.763.989	3.986.141	-67.777.768	4
		Euro S	74.231	78.231	8%	434.10	92,40	-79%	32,223,263	6.050.700	-25.364.503	-
		Euro 6	4.901	4.901	8%	163,49	92,40	-40%	765.285	454.676	-300 609	-
		Diesel oil total	144,068	144,068	6%	414.12	105,62	.77%	65,712,732	15,216,007	-50.496.726	
		LDVs Total	149,994	149,994	8%	445.23	108,20	-76%	66,781,025	16,229,684	-50.551.340	
		pre-Euro	891	891	9%	1070.81	1019.23	-5%	954,197	508,234	45.963	
		Eurol	583	583	9%	731.38	752.57	3%	433,675	446.236	12.560	
		Earl	4.375	4.375	05	768.25	645.00	-10%	3,448,614	2.822.021	-626.534	
A3bii.		Euro II	10.333	10.333	9%	632.67	450,91	-21%	6.539.364	4.741.827	-1.797.536	-
leavy Duty Vehicle:	Diesel Oil	Ears IV	4.449	4.449	95	475.90	362.29	-20%	2.117.210	1.586.001	-658.338	
Buses			34.390	24.390	25							
		Ears V				366,38	186,22	-49%	8.935.974	4.617.617	-4.418.467	1
		Ewa M	9,126	9,126	9%	62.79	186,22	195%	673.066	1.680.481	1.117.336	1
		Buses Total	54,157	54.157	8%	494,73	308,24	-27%	23,062,109	16.683,117	4.308.992	
		pre-Euro	3.933	3.933	9%	1004,01	737,35	-29%	4.067.249	2.980.319	-1.156.530	-
		Eart	1.585	1.585	9%	748,96	587,92	-32%	1.163.462	789.813	-373.589	-
A3bH-		Ears I	8.876	8.876	0%	817,75	585,52	-38%	7.258.045	4.485.828	-2.771.218	-
eavy 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	
Venecie: Trucks &	Dieser Oil	Ears IV	34.297	36.267	9%	396,94	291,06	-29%	9.640.394	6.945.501	-2.794.893	-
Lorries		Eura V	299,736	299,736	9%	297,22	163,92	-46%	74,600,233	39.978,610	-34.621.623	
		Ewa VI	291,460	261,460	2%	61,77	153,92	149%	16.149.288	40.244.036	24.094.748	1
		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	3,360	3,300	25	327.31	177.29	39%	427.113	585,796	168.502	
A3ble -		Euro 2	3.375	3.375	95	125.04	197,68	55%	421.951	66T.076	345.127	
Motorised Two	Gaspine	Euro 3	6.443	6.643	95	40.30	197,68	391%	209,627	1.273.571	1.013.943	3
Wheelers	Catorile											
(MZWs)		Ears 4	66	66	9%	17,47	197,68	1031%	1.134	12.802	11.696	10
		Ears 6	0	0	9%			0%		0		
		M2Ws Total	18,785	18,785	8%	96,14	181,66	89%	1,805,897	3,452,476	1.606.579	

				<b>Activity Date</b>	9	Impli	ed Emission	Factor		NO, Emi	ssions	
ER Code	Fuel		current		difference	current	adjusted	difference	current	adjusted	adjustment	different
			in [	U)	in [N]	in p	[LT/gr	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	-16
		Ears 1	17,449	17,449	9%	372,99	241,68	-06%	6,689,311	4.217,044	-2.291.267	-06
		Ews 2	30.435	30.435	0%	217,43	141,75	-35%	6.617.570	4.314.140	-2.303.430	-36
		Euro 3	54.271	54,271	9%	78,40	76.27	-3%	4.254.938	4.139.376	-115.562	
	Gassline	Euro 4	315,086	315,086	9%	54.96	51.25	-7%	17.316.320	16,151,861	-1.154.450	
		Euro 5	180,245	180,245	9%	19.17	51.26	167%	3.485.382	9,239,815	5.784.513	15
		Euro 6	116,791	116,791	9%	26,66	51,26	92%	3.060.226	5.884.372	2 824 146	1
LARDI.		Gasoline total	724,571	734,571	8%	67,66	69,88	35.	49.026.074	50,634,714	1,607,848	
эмендег		ре-биз	1.310	1.310	9%	306,09	264,96	-13%	480.983	347.020	-63.893	-1
Cars		Eura 1	3.360	3,360	9%	299,17	271,67	-9%	1,002,298	910.182	92.116	
		Euro 2	13,798	13,788	2%	407,17	222,40	-45%	5.614.130	3,066,393	-2 547 736	4
		Euro 3	52,128	52,128	8%	608.05	179.65	-70%	31,696,478	9.384.798	-22.331.769	-7
	Diesel Oil	Eura 4	157,847	187,847	9%	410.10	158.34	41%	64,733,465	24.583.323	-39,740,142	4
		Euro 5	283.480	283,400	0%	423.39	155.34	-63%	120,157,686	44,873,190	-75.254.465	4
		Euro 6	184,760	184,760	9%	262.61	150.34	-40%	49.521.163	29,255,985	-19.265.258	4
		Diesel oil tutal	696,582	696,582	85	390.65	161.95	.59%	272,126,091	112,010,721	.159,315,378	-
		PCs Total	1.421.162	1,621,162	65	225,98	115,01	.005	321.152.965	163,445,435	.157,207,530	
		рэ Еиз	940	940	2%	661.61	646.96	-47%	612.240	606,918	6 322	-
		Eura 1	124	124	2%	906.23	312,78	45%	112.083	38.682	.73.401	
			485	485	624	302.12	221.62	-21%	140.344	182,950	-37.394	4
		Euro 2	586	586	15	110.57	115.36	4%				-
	Gaseline	Euro 3	1,476	1.476			53.38		65.965	68.812 76.816	2.857	
		Euro 4			0%	50,72		5%	74.877		3 536	16
		Euro S	1.660	1.660	9%	21,73	53,30	146%	36.240	89.034	52.706	
Albii .		Ears 6	918	919	9%	19,68	63,38	187%	17.062	49.000	31.548	1
John Duny		Gosoline total	6.186	6.186	6%	171,15	167,18	.7%	1.058,799	1.034.211	-24.508	
Vehicles		ha Ena	2.067	2.067	9%	410,41	306,79	-26%	890.499	631.163	-219.336	- 4
(LOVA)		Ears 1	1,538	1,538	9%	390,47	215,25	-45%	600.716	331.158	-269.558	4
		Euro 2	3.580	3.580	9%	321,26	193,04	-40%	1.143.793	687.293	-456.501	4
	Diesel Oil	Euro 3	11.664	11,664	9%	595,08	150,79	-75%	6.940.879	1.758.747	-6.182.132	-7
		Euro 4	39.050	39.050	9%	506,78	93,09	-82%	19.789.647	3.635.035	-16.154.612	-1
		Euro S	75.799	75.789	9%	412,66	93,09	-70%	32.790.966	T.054.945	-26.736.811	-
		Eura 6	19.626	19,625	9%	161,71	93,09	-39%	2.977.439	1.826.876	-1.168.994	
		Diesel oil tutal	153,264	153,264	8%	424,66	183,89	-76%	65.083.930	15,925,216	-49.168.714	
		LDVs Total	199.470	199,470	8%	414,83	106,35	-74%	66.152.729	16.959.427	-49.193.302	
		ps-Euro	136	736	9%	1073,33	1019,23	-8%	790.259	750.425	-35.834	
		Eart	411	411	9%	731,97	752,57	3%	300.684	389.062	8.459	
A3bii.		Eart I	3.325	3.325	9%	767,91	645,79	-10%	2,620,067	2.147.460	-472.606	
navy Duty		Ears II	8.678	8.678	9%	631,33	459,12	-21%	5.478.480	3.984.005	-1.494.395	4
Vehicles	Diesel Oil	Ears IV	3.023	3.023	9%	474.07	362.49	-20%	1.012.380	1.347.600	-464.700	4
Beses		Ears V	21.913	21.913	9%	363.92	186,84	-49%	7.907.976	4.063.686	-3.894.291	4
		Ewa VI	14.696	14.696	2%	68.62	185.84	219%	854.215	2,712,580	1.858.375	2
		Buses Total	53,382	53,382	8%	379,80	296,71	-23%	19,793,901	15,384,828	4.489.073	-
		prečira	3,686	3,686	9%	1034.40	737.38	-29%	3,730,272	2.689.016	-1.071.256	-
		Eurol	1.311	1.311	8%	748.03	465.38	-31%	980.842	614.151	-356,630	
A3bH-		Earl I	7.007	7.007	95	817.66	583.45	-30%	5.794.876	3.568.026	-2.226.851	
eavy Duty		Ears II	36,086	26,086	9%	630.17	366.72	-44%	16.942.661	9.563.641	-7.378.821	
Vehicle:	Diesel Oil	Ears IV	20.082	20.002	9%	397.77	279.34	-30%	7.966.414	6.587.466	-2.368.568	
Trucks &		Ears V	264.366	264.365	8%	298,16	164,36	-47%	69.290.799	31.636.367	47 745 342	
Lorries		Ears VI	335.065	335.065	2%	65.62	154.35	135%	21,985,366	51.718.641	29 733 275	1
			598,263	598,263	8%	195.02	175,92	.10%	116,671,141	105,246,508	-11.424.633	
		Trucks Total										
		pre-Cara	5.336	5.336	9%	125,91	157,19	25%	671.888	838,789	166.881	
A3bir -		Ears 1	3.257	3.257	0%	125,39	177,86	41%	411.617	579.244	167.627	
Botorised		Euro 2	3.396	3.396	0%	122,55	198,33	62%	416.200	673.548	257.348	
Two	Gassline	Ears 3	6.741	6.741	9%	40,22	190,33	393%	271.107	1.336.966	1.065.849	31
(MDWs)		Eura 4	430	430	9%	18,29	199,33	986%	7.962	86.270	77.408	96
(ment)		Ears 6	0	0	0% 0%	92,83	183,39	0%		0		
		M2Ws Total	19,160	19,160				1615	1,778,674	3,513,787	1,235,114	

adjustment\_de-a 10/12

			- 1	Activity Data		Impli	ed Emission	Factor		NO, Emi	ssions	
ER Code	Fuel		current	adjusted	difference	current	adjusted	difference	CURTORS	adjusted	adjustment	differen
			in [		in [N]		[LT/gr	in [5]		in [kg]		in [5]
		ребиз	12.219	12.219	9%	637,59	644,11	-15%	7.790.965	6.649.721	-1.142.234	-4
		Ews 1	14,362	14,362	9%	374.24	241,68	-36%	6.371,161	3,469,643	-1.902.518	4
		Ews 2	24.295	24.295	9%	221.07	111,06	-50%	5.360.977	2,688,163	-2.862.814	4
	Gassline	Euro 3	43.642	43.642	9%	80,15	76,96	4%	3.487.781	3.358.617	-139.164	
	-	Euro 4	276,736	278,738	9%	55,98	52,30	-1%	15.683.488	14.578.755	-1.824.743	
		Euro 5	166,630	165.530	9%	19,38	52,30	170%	3.228.282	8.725.668	5.497.456	11
		Euro 6	159.041	159.041	9%	0,00	52,30	0%	4.190.422	8.318.250	4.127.828	- 1
1.A.3.b i .		Gasoline total	689.007	699.027	0%	64,02	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	
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	4
	Diesel Oil	Euro 3	40.795	40.795	9%	612,49	180,15	-71%	24.932.029	T.333.241	-17.558.788	-
		Euro 4	130.534	130.534	9%	414,71	160,48	-61%	54,133,837	20.937.329	-33.196.508	4
		Euro S Euro 6	251.212 220.685	251.212 228.685	95 95	415,25 254,67	190,48	-81% -31%	104.585.785 58.284.140	40.293.731 36.680.440	-64.273.836 -21.603.708	4
			666,074	666,074								
		PCs Total	1,365,181	1,365,101	65	371,66	163,30	.50%	267,596,063	196,555,421	.136,833,639	-
			1.365.101	917	0%	214,34 660,53	645,96	-89%	292,589,060 596,869	196.500.421 682.662	-136.033.639 -4.207	
		pro Euro	188	108	8%			-86%		33.805	-64.723	4
		Ears 1 Ears 2	377	377	7%	911.58 303.64	312,78 224,45	-20%	98.528 114.682	84,713	-29,839	-
		Euro 3	511	511	PS	111.92	118.84	6%	57.282	60.739	3.537	4
	Casoline	Euro 4	1,275	1.275	15	52.02	54.36	4%	65,298	69.278	2.550	
		Euro S	140	1.483	9%	23.70	54.36	129%	35.160	80.626	45.465	1
		Eura 6	160	160	9%	18.69	64.36	192%	30,660	89.326	68.775	1
Albii.		Gasoline total	6,315	6.315	65	158.22	160,11	15.	999,199	1.011.138	11.839	- 1
ight Duty		рэ Еиз	1.872	1.872	2%	411,97	306,79	-26%	771.307	674.412	-196.525	- 4
Vehicles		Eura 1	1,295	1,295	2%	388.84	215.25	45%	483,129	272.296	-220.842	
(LOAN)		Euro Z	2.842	2.842	2%	318.56	193,80	-39%	905.309	550,759	-354.540	
		Euro 3	9.363	9.363	15	559,50	150.74	-75%	5.609.152	1.411.299	4.197.853	
	Diesel Oil	Eura 4	13.232	33.232	95	500.42	93.81	-82%	16.929.185	3.117.457	-13.811.648	
		Euro S	66.283	66.283	9%	412.92	93,81	-70%	29.634.000	6.217.060	-02.477.828	
		Eura 6	39.482	39.482	9%	168.79	93.81	-30%	5.941.615	3,686,228	-2.345.397	
		Diesel oil total	154,259	154,259	65	364.71	102,69	.73%	59.344.525	15,840,310	.41.504.215	
		LDVs Total	160,574	160,574	8%	375,80	104,94	-72%	60.343.725	16,851,449	41.492.276	
		pre-Euro	547	547	9%	1078,16	1019.23	-8%	589.367	587.147	-32.210	
		Eurol	237	237	2%	732.78	752.57	3%	173,678	178,368	4.890	
A3bH.		Earl	2.270	2.270	0%	767.83	646.33	-10%	1,788,686	1.467.437	-321,249	
eavy Duty		Earn II	6.757	6.757	0%	630.09	459.32	-21%	4.262.724	3.103.492	-1.159.232	
Vehicles	Diesel Oil	Ears IV	3.043	3.043	9%	473,56	362,73	-25%	1.429.790	1.073.303	-366.467	
Beses		Fara V	19,189	18,189	8%	362.42	186.37	-49%	6,663,265	3.376.046	-3.198.249	
		Ears VI	20,670	20.670	8%	64.09	186.37	220%	1.176.026	3.862.314	2 676 288	2
		Buses Total	91,634	51,634	8%	309,75	253,50	.19%	15,993,526	13,687,106	-2.386.429	
		pre-Euro	3.282	3.252	9%	1034.82	737,35	-29%	3.375.389	2,485,071	-879.288	-
		Eurol	1.094	1.094	8%	747.82	465.35	-31%	818.052	512.378	-305.674	
A3.bH-		Eart I	5.544	5.544	0%	817.44	581,68	-39%	4.532.198	2.791.510	-1.750.658	-
eavy Duty		Euro II	20.583	20.583	9%	629,54	353,56	-64%	12.957.751	T.27T.279	-6.600.472	-
Vehicle: Trucks &	Diesel Oil	Ears IV	15.912	15.912	9%	398,09	276,23	-31%	6.334.421	4.395.424	-1.908.997	-
Lorries		Ears V	196,983	196,983	8%	292,40	154,68	-47%	45,964,163	24.293.309	-21.620.843	
		Ewa VI	381,799	381,799	2%	68,76	154,68	125%	26.251.482	59,055,898	32.804.495	1
		Trucks Total	585,186	585,186	8%	171,18	172,10	1%	100,173,337	180,710,869	537,532	
		pre-Cara	4.940	4.940	9%	125,05	158,61	26%	622,686	783.451	160.795	
A3bir-		Ears 1	2.965	2.965	9%	125,14	177,79	41%	374.114	527.294	153,150	
Motorised		Euro 2	3.221	3.221	9%	129,33	198,64	65%	387.586	639.833	252.237	
Two	Gassine	Ears 3	6.241	6.241	9%	40,24	190,64	394%	291.126	1.239.680	908.962	3
Wheelers		Ears 4	1.130	1.130	9%	20,41	199,64	973%	23.066	224,682	201.436	
(M2WH)		Ears 6	0	0	9%	0,00		0%	0	0		
		M2Ws Total	18.497	18.497	8%	89,66	184,61	100%	1,658,558	3,414,757	1,756,209	1

				Activity Date			led Emission			NO, Emi		
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	13.669	13,660	9%	638,58	644,11	-15%	9.664.621	7.382.698	-1.291.822	-1
		Ews 1	12,427	12,427	9%	379,32	241,68	-36%	4.701.480	3.083.383	-1.698.096	-0
		Ews 2	20,086	20,086	9%	225.58	92.60	-69%	4.531.070	1.858.018	-2.673.052	- 4
	Gassine	Euro 3	36.216	36.216	9%	82,22	78,12	-8%	2.977.840	2.829.166	-148.673	
	Cataline	Euro 4	255,220	295,220	9%	57,04	53,29	-7%	14.558.295	13.589.621	-858.554	
		Euro 5	100.537	160.537	9%	19,77	53,29	170%	3.173.726	8.584.356	5.380.628	11
		Euro 6	206.636	206,636	9%	25,63	53,29	180%	5.295.099	11.010.782	5.715.603	10
14.3.01.		Gasoline total	764,691	764,691	8%	62,30	60,45	10%	43,981,941	40.230.025	4.336.804	
assenger		ребиз	2.736	2.736	9%	330,76	264,96	-21%	913,198	724.923	-198.275	4
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 R26	
	Diesel Oil	Euro 3	33.019	33.019	9%	615,11	180,42	-21%	20.310.125	5.95T.483	-14.352.723	
	Diese Un	Euro 4	111.335	111.335	9%	419,97	162,44	-61%	46,668,685	18.085.228	-28.583.457	4
		Euro 5	231,794	231,784	0%	410,37	162,44	-60%	95.117.643	37.680.987	-57.456.645	4
		Euro 6	273.511	273.511	9%	227,30	162,44	-29%	62.169.238	44.429.104	-17.740.054	
		Diesel oil tutal	663,041	663,041	8%	345,81	165,07	.52%	229,566,088	189,582,982	.119.903.106	
		PCs Total	1.368.532	1.368.532	6%	199,83	115,32	-675	273.468.029	157.821.007	.115.647.822	
		pa Eura	926	926	9%	649,69	645,96	-1%	601,469	587.992	-3.468	
		Euro 1	97	97	9%	915,28	312,78	-86%	88.953	30.396	-58.957	
		Euro 2	316	316	9%	304,63	224,45	-26%	96,158	70.848	-25.310	-
	Casaline	Euro 3	447	447	9%	112,68	121,47	8%	50.385	54.293	3.526	
	Calenda	Euro 4	1.126	1.126	0%	53,00	55,26	4%	59.682	62,199	2.547	
		Euro S	1.361	1.361	9%	25,34	55,36	110%	34.240	74.680	40.432	1
		Euro 6	2.420	2.420	9%	19,76	66,36	196%	45.393	133.753	98.358	- 1
A.3.b ii . .ight Duty		Gosoline total	6,683	6.683	6%	146,08	153,25	5%	976.219	1.024.150	47.331	
Vehicles		pa Eura	1,764	1,764	9%	410.96	386,79	-25%	725,111	641.316	-183.796	
(LOVA)		Ears 1	1,079	1,079	9%	388,52	215,25	-45%	420.295	232.255	-188.830	
		Euro 2	2.334	2.334	9%	315,58	194,79	-38%	737,682	454,650	-282.912	-
	Diesel Oil	Euro 3	7,649	7,649	9%	601,11	150,79	-75%	4.587.943	1.152.711	-3.445.233	-
	Diese On	Euro 4	26.711	26,711	9%	512,28	94,57	-82%	14.765.365	2.715.154	-11.993.154	-
		Euro S	50.716	59.716	9%	434,30	94,57	-70%	25.499.580	5.552.420	-19.567.152	-
		Euro 6	99.931	98.931	9%	146,18	94,67	-35%	9.614.686	6.672.892	-3.841.614	
		Diesel oil tutal	199,183	159,183	6%	347,42	101,90	-71%	55.303.335	16.221.445	-39.081.090	
		LDVs Total	165,866	165,866	6%	339,31	183,97	-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	
		Eart	147	147	9%	736,37	752,57	2%	165.212	110.583	2.381	
A3bii.		Eart I	1.611	1.611	9%	769,47	646,77	-10%	1.271.445	1.041.621	-229 824	
eavy Duty	Diesel Oil	Euro II	5.789	5.789	9%	631,66	459,55	-21%	3.686.361	2.623.779	-902.572	4
Vehicles	Design on	Ears IV	2.747	2.747	9%	473,92	362,64	-26%	1.302.061	969.413	-332 648	4
Beses		Eura V	17,120	17,120	9%	362,91	186,84	-49%	6.213.176	3.199.791	-3.014.394	
		Eara 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	6%	274,41	247,81	-10%	14,527,012	13,118,578	-1.408.434	
		pre-Euro	3.140	3.140	9%	1034,96	737,38	-29%	3.250.020	2.315.443	-534.577	-
		Eart	969	909	9%	747,60	468,38	-31%	724.240	453.754	-279.456	-
A3.b III -		Euro I	4.565	4.565	9%	817,42	581,04	-39%	3.734.343	2.288.967	-1.445.376	-
eavy Duty Vehicle:	Diesel Oil	Euro II	16.377	16.377	9%	629,94	361,68	-64%	10.300.323	5.756.580	4.543.743	
Trucks &	Desire On	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	-49%	36,960,689	19,481,449	-17,669,168	
		Ewa VI	432,498	432,498	9%	72.08	154,92	115%	31,175,496	67,003,863	35.828.367	1
		Trucks Total	595,913	595,913	6%	150,35	199,17	10%	91,380,790	100,889,376	9.428.676	
		pr-Sur	4.813	4.813	9%	125,69	164,79	31%	684.997	792,771	187.714	
A3biv -		Ears 1	2.835	2.835	9%	125,39	177,29	41%	385.486	582.589	147.113	
Motorised		Euro 2	3.094	3.094	9%	119,33	190,06	67%	309.224	615.317	346.093	
Two	Gassline	Ears 3	6.082	6.062	9%	40,03	190,06	361%	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	366.178	
(MWW)		Eura 6	0	0	9%	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 11/12

	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)	-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". <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 2020 adjustment proposal differed significantly from the adjustment applied for and accepted in 2019. In comparison to 2020, the TREMOD model applied for the 2021 submission has been revised only slightly in terms of  $NO_x$  emission factors. Hence, the 2021 adjustment proposal differs only slightly from the (accepted) proposal provided with submission 2020.

#### Adjustment description as provided in IIRs 2014 and 2015:

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

<sup>10)</sup> 11) 12) 13) : 5 : ifeu, 2002: Final report to UFOPLAN study FKZ 201 45 112 (German version only): Aktualisierung des Datenund 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 Daten- und 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:

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:

adjustment de-a 12/12

ECE/EB.AIR/WG.1/2018/21: Review of adjustment applications 2018; URL:

 $https://www.ceip.at/fileadmin/inhalte/emep/pdf/2018/ADJ\_ece.eb.air.ge. 1.2018. 10-ece.eb.air.wg. 1.2018. 21\_advance.pdf, and also be a substitute of the property of the pro$ 

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>2), 10)</sup> 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

<sup>3), 12)</sup> 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 <sup>4), 11)</sup> 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) (bibcite 4)
- 6) (bibcite 5)
- 7) (bibcite 6)
- 8) (bibcite 18)
- 9) (bibcite 19)

<sup>&</sup>lt;sup>1), 13)</sup> IIASA, 1999: Amann, M.; Bertok, I.; Cofala, J.; 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 Risques 20, avenue de Ségur75302 Paris 07 SP, April 1999 – URL: https://iiasa.ac.at/web/home/research/res