

Annex 2.2 Detailed discussion of methodology and data for estimating CO₂ emissions from fossil fuel combustion – mobile combustion - explanations for the calculation of specific emission factor for each fuel and using higher Tier method

2.2.1 International aviation

In the cooperation between NEPA and Environment Agency of Austria, activity implemented in December 2011, Marc Schuman – GHG expert from Luxembourg helped to implement new Tier 2 methodologies, both for domestic and international aviation.

The source data is Eurostat-questionnaire and source for emissions factors is IPCC 2006.

The value for fuel consumption for each the type of aircraft is presented in Table 1.

Table 1 The calculation of the number of cycles flight for each the type of aircraft

	Fuel consumption		LTO EFs			Source = Eurostat website							
AIRCRAFT/TIME	kg fuel/LTO	source	kg CH4/LTO	kg N2O/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
AIRBUS--A-321 ALL MODELS aircraft	960	2006 IPCC Vol2 Ch3 Table 3.6.9	0.14	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9		1,752	700	470	1,082	2,631	2,037	1,616
BOEING--727 ALL MODELS aircraft	1460	2006 IPCC Vol2 Ch3 Table 3.6.9	0.81	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	4	3	2	2	:	:
BOEING--MD-87 aircraft	1010	2006 IPCC Vol2 Ch3 Table 3.6.9	0.19	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	99	:	:	:	104	92	:
CANADAI--CL- 600 REGIONAL JET ALL MODELS aircraft	330	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	1,045	3,681	4,249	5,723	6,133	6,849	5,816
CANADAI--CL- 65 REGIONAL JET ALL MODELS aircraft	330	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	:	:	:	:	:
LOCKHEED--L- 1011 TRISTAR aircraft	2310	2006 IPCC Vol2 Ch3 Table 3.6.9	7.4	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	:	:	:	:	:

AIRCRAFT/TIME	Fuel consumption		LTO EFs			Source = Eurostat website							
	kg fuel/LTO	source	kg CH4I/LTO	kg N2OI/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
OTHER AVROLINER aircraft	600	2006 IPCC Vol2 Ch3 Table 3.6.9	0.13	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	62	3	101	:	:	1	363
OTHERS aircraft						:	5,224	2,040	2,915	3,707	5,067	7,946	7,345
AEROSPATIALE--ATR-72 ALL MODELS aircraft	200	2006 IPCC Vol2 Ch3 Table 3.6.9	0.03	0.02	2006 IPCC Vol2 Ch3 Table 3.6.9	:	149	336	655	657	977	1,256	2,356
AIRBUS--A-340 ALL MODELS aircraft	2020	2006 IPCC Vol2 Ch3 Table 3.6.9	0.39	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	8	:	2	:	4
BOEING--777 ALL MODELS aircraft	2560	2006 IPCC Vol2 Ch3 Table 3.6.9	0.07	0.3	2006 IPCC Vol2 Ch3 Table 3.6.9	:	58	64	40	23	26	2	3
BOEING--MD-80 aircraft	1010	2006 IPCC Vol2 Ch3 Table 3.6.9	0.19	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	3,557	3,353	7,233	7,102	3,366	387	542
DORNIER--328 aircraft	280	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	10	:	5	4	31	6	16

AIRCRAFT/TIME	Fuel consumption		LTO EFs			Source = Eurostat website							
	kg fuel/LTO	source	kg CH4I/LTO	kg N2OI/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
DOUGLAS--DC-10 ALL MODELS aircraft	2310	2006 IPCC Vol2 Ch3 Table 3.6.9	0.24	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	:	8	:	9	:
DOUGLAS--DC-8 ALL MODELS aircraft	1700	2006 IPCC Vol2 Ch3 Table 3.6.9	0.15	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	:	:	:	:	:
OTHER ANTONOV aircraft						:	611	536	566	78	:	5	:
OTHER TUPOLEV aircraft	1890	2006 IPCC Vol2 Ch3 Table 3.6.9	1.32	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	38	8	:	:	4	:	:
SAAB--340 aircraft	75.1	EMEP/EEA GB 2009 Ch1A3a Annex excel file	0	0.02	2006 IPCC Vol2 Ch3 Table 3.6.9	:	6,107	4,900	2,481	2,374	8	104	604
AEROSPATIALE--AS-332 aircraft						:	:	:	:	2	:	:	7
AIRBUS--A-300 ALL MODELS aircraft	1720	2006 IPCC Vol2 Ch3 Table 3.6.9	0.12	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	8	3	2	:	4	:	:
BOEING--MD-82 aircraft	1010	2006 IPCC Vol2 Ch3 Table 3.6.9	0.19	0.1	2006 IPCC Vol2 Ch3	:	28	22	7	1,371	566	310	410

AIRCRAFT/TIME	Fuel consumption		LTO EFs			Source = Eurostat website							
	kg fuel/LTO	source	kg CH4I/LTO	kg N2OI/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
BRITTEN-NORMAN--BN-2 aircraft						:	3	:	:	3	:	:	:
FOKKER--50 aircraft	760	2006 IPCC Vol2 Ch3 Table 3.6.9	0.14	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	2	3	:	:	:
TUPOLEV--TU-154 aircraft	1890	2006 IPCC Vol2 Ch3 Table 3.6.9	1.32	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	260	500	124	:	211	:	:
AIRBUS--A-330 ALL MODELS aircraft	2230	2006 IPCC Vol2 Ch3 Table 3.6.9	0.13	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	32	:	90	4	:	:	:
BAE-146 ALL MODELS aircraft	570	2006 IPCC Vol2 Ch3 Table 3.6.9	0.14	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	3,163	3,643	1,559	267	1,124	999	958
BAE-AVROLINER--RJ-100 aircraft	570	2006 IPCC Vol2 Ch3 Table 3.6.9	0.14	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	62	141	385	2,256	2,750	1,454	285
BOEING--717 ALL MODELS aircraft	680	2006 IPCC Vol2 Ch3 Table 3.6.9	0.01	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	232	468	1,028	65	:	:	:

AIRCRAFT/TIME	Fuel consumption		LTO EFs			Source = Eurostat website							
	kg fuel/LTO	source	kg CH4I/LTO	kg N2OI/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
BOEING--737 ALL MODELS aircraft	870	2006 IPCC Vol2 Ch3 Table 3.6.9	0.45	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	34,231	39,142	45,336	43,830	43,003	47,384	47,175
EMBRAER--120 aircraft	310	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	618	1,061	1,627	216	2,000	1,797	1,680
OTHER AEROSPATIALE aircraft	200	2006 IPCC Vol2 Ch3 Table 3.6.9	0.03	0.02	2006 IPCC Vol2 Ch3 Table 3.6.9	:	1,011	496	466	596	13	9	2,529
OTHER BRITTEN-NORMAN aircraft						:	:	:	:	:	:	:	:
OTHER DE HAVILLAND aircraft	200	2006 IPCC Vol2 Ch3 Table 3.6.9	0	0.02	2006 IPCC Vol2 Ch3 Table 3.6.9	:	10	:	12	21	4	862	476
OTHER DORNIER aircraft	280	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	5	:	4	3	18	65	4
OTHER SAAB aircraft	153	Emep/EEA GB 2009 Ch1A3a Annex excel file	0.03	0.02	2006 IPCC Vol2 Ch3	:	2	:	:	:	:	:	352

AIRCRAFT/TIME	Fuel consumption		LTO EFs		Source = Eurostat website								
	kg fuel/LTO	source	kg CH4I/LTO	kg N2OI/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
AIRBUS--A-310 ALL MODELS aircraft	1510	2006 IPCC Vol2 Ch3 Table 3.6.9	0.63	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	17	:	20	1,180	2,802	95	794
BAE- AVROLINER--RJ- 85 aircraft	600	2006 IPCC Vol2 Ch3 Table 3.6.9	0.13	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	13	521	834	38	60	78	25
BOEING--MD-81 aircraft	1010	2006 IPCC Vol2 Ch3 Table 3.6.9	0.19	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	1,334	1,394	26	1,667	31	52	:
BOEING--MD-83 aircraft	1010	2006 IPCC Vol2 Ch3 Table 3.6.9	0.19	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	78	4	15	67	190	296	470
BOEING--MD-88 aircraft	1010	2006 IPCC Vol2 Ch3 Table 3.6.9	0.19	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	:	:	:	:	:
EMBRAER--135 aircraft	310	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	7	:	2	2	26	16	14
FOKKER--100 aircraft	760	2006 IPCC Vol2 Ch3	0.14	0.1	2006 IPCC Vol2	:	124	1,647	3,368	4,075	3,708	4,060	2,196

AIRCRAFT/TIME	Fuel consumption		LTO EFs		Source = Eurostat website								
	kg fuel/LTO	source	kg CH4I/LTO	kg N2OI/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
FOKKER--70 aircraft	760	2006 IPCC Vol2 Ch3 Table 3.6.9	0.14	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	2,365	1,796	2,485	2,116	2,723	1,973	1,692
OTHER FOKKER aircraft	760	2006 IPCC Vol2 Ch3 Table 3.6.9	0.14	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	71	215	183	26	8	117
TUPOLEV--TU-134 aircraft	930	2006 IPCC Vol2 Ch3 Table 3.6.9	1.8	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	:	:	:	:	:
AEROSPATIALE--ATR-42 ALL MODELS aircraft	200	2006 IPCC Vol2 Ch3 Table 3.6.9	0.03	0.02	2006 IPCC Vol2 Ch3 Table 3.6.9	:	5,783	7,379	8,329	5,701	5,220	5,622	3,514
AIRBUS--A-319 ALL MODELS aircraft	730	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	2,411	5,487	7,475	7,251	9,459	9,756	13,080
ANTONOV--AN-32 aircraft	138	EMEP/EEA GB 2009 Ch1A3a Annex excel file	0.03	0.02	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	:	:	:	:	2
BOEING--747 ALL MODELS aircraft	3510	2006 IPCC Vol2 Ch3 3.6.9	0.27	0.4	2006 IPCC Vol2	:	39	12	1	4	4	7	4

AIRCRAFT/TIME	Fuel consumption		LTO EFs		Source = Eurostat website								
	kg fuel/LTO	source	kg CH4I/LTO	kg N2OI/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
EMBRAER--145 aircraft	310	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	552	1,838	6,172	4,638	367	785	944
OTHER AIRBUS aircraft	1333.75	average of Airbus aircrafts listed here	0.20	0.15	average of Airbus aircrafts listed here	:	124	152	90	164	180	112	44
SAAB--2000 aircraft	153	EMEP/EEA GB 2009 Ch1A3a Annex excel file	0.03	0.02	2006 IPCC Vol2 Ch3 Table 3.6.9	:	4,454	6,241	10,424	10,824	12,151	10,405	9,007
BOEING--MD-90 aircraft	870	2006 IPCC Vol2 Ch3 Table 3.6.9	0.01	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	18	:	:	:	2	:	:
DOUGLAS--DC-9 ALL MODELS aircraft	840	2006 IPCC Vol2 Ch3 Table 3.6.9	0.46	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	2	:	4	29	:	:	22
EMBRAER--170 aircraft	310	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	148	460	870	715	767	422	1,284
OTHER BAE aircraft	570	2006 IPCC Vol2 Ch3 Table 3.6.9	0.14	0.1	2006 IPCC Vol2	:	240	3	823	1,108	894	758	108

AIRCRAFT/TIME	Fuel consumption	LTO EFs			Source = Eurostat website								
	kg fuel/LTO	source	kg CH4I/LTO	kg N2OI/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
OTHER BOEING aircraft	1435.33	average of Boeing aircrafts listed here	0.21	0.15	average of Boeing aircrafts listed here	:	7	34	32	37	46	37	18
OTHER CANADAIR aircraft	330	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	593	547	927	784	565	391	108
OTHER DOUGLAS aircraft	2310	2006 IPCC Vol2 Ch3 Table 3.6.9	0.24	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	1	:	:	:	:	:	:
AIRBUS--A-318 ALL MODELS aircraft	730	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	617	1,642	8,205	12,125	11,126	12,077
AIRBUS--A-320 ALL MODELS aircraft	770	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	7,676	4,742	6,105	12,724	22,094	26,508	27,128
BOEING--757 ALL MODELS aircraft	1460	2006 IPCC Vol2 Ch3 Table 3.6.9	0.01	0.1	2006 IPCC Vol2 Ch3 Table 3.6.9	:	445	385	417	493	703	673	614
BOEING--767 ALL MODELS aircraft	1750	2006 IPCC Vol2 Ch3	0.1	0.2	2006 IPCC	:	230	352	361	1,080	1,481	721	700

AIRCRAFT/TIME	Fuel consumption	LTO EFs			Source = Eurostat website								
	kg fuel/LTO	source	kg CH4/LTO	kg N2O/LTO	source	2003	2004	2005	2006	2007	2008	2009	2010
BOEING--MD-11 aircraft	2310	2006 IPCC Vol2 Ch3 Table 3.6.9	0.24	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	:	:	:	4	:	:	:
OTHER EMBRAER aircraft	310	2006 IPCC Vol2 Ch3 Table 3.6.9	0.06	0.03	2006 IPCC Vol2 Ch3 Table 3.6.9	:	625	874	409	616	88	357	1,240
OTHER LOCKHEED aircraft	2310	2006 IPCC Vol2 Ch3 Table 3.6.9	7.4	0.2	2006 IPCC Vol2 Ch3 Table 3.6.9	:	4	3	:	1	:	:	:
UNKNOWN aircraft						:	2,894	3,294	4,267	5,424	4,811	4,290	2,015
Total aircraft						:	89,200	100,038	126,421	140,290	150,142	151,642	152,027
Total fuel consumption LTO-international		t fuel					54,374	61,618	76,611	89,995	99,974	96,002	98,050
Total CH4 emissions LTO-international		Gg CH4					0.019	0.022	0.026	0.027	0.028	0.027	0.027
Total N2O emissions LTO-international		Gg N2O					0.006	0.007	0.009	0.011	0.012	0.012	0.012
IEF CH4 LTO-national		kg CH4/t fuel					0.352	0.358	0.337	0.301	0.281	0.284	0.280
IEF N2O LTO-national		kg N2O/t fuel					0.118	0.119	0.118	0.119	0.122	0.122	0.122

Methodology for GHG emissions estimation for international and domestic aviation

Fuel consumption (GJ) is calculated with formula :

$$\text{Fuel consumption (GJ)} = \text{Fuel consumption (Kt)} * 1000 * \text{NCV (GJ/t)} / 1000$$

Fuel consumption was divided in fuel consumption for cycles LTO and fuel consumption for cycles Cruise .

GHG emissions (Gg) were calculated with formula :

$$\text{CO}_2 \text{ emissions} = \text{CO}_2 \text{ emissions for LTO} + \text{CO}_2 \text{ emissions for Cruise}$$

Emission factors from IPCC 2006, for each gas, were used.

2.2.2 Road Transport

For Road Transport was used COPERT III model . For the period 1990 – 2004 activity data for fleet population were taken from the link [www.emisia.com/Copert/Vehicle Fleets/ Road](http://www.emisia.com/Copert/Vehicle_Fleets/Road) Data for Romania and I compared with data for Bulgaria and Hungary (neighboring countries). For the years 2005-2010 activity data were provided by Romanian Auto Register (RAR).

The data on mileage, speed and other parameters useful in COPERT III were aggregated.

Database was created by running the COPERT III model and reports on CO₂, N₂O, CH₄, NO_x, NMVOC, CO and SO₂ emissions were generated.

The emissions data have been introduced in the CRF tables.

Activity data for Road Transport received from R.A.R. is presented in Table 2.

Table 2 Activity data for 2010

Sector	Subsector	Technology	Population	Route (km)	Fuel injection (%)	Evaporative control (%)	Urban speed (km/h)	Rural speed (km/h)	Highway speed (km/h)	Urban route (%)	Rural route (%)	Highway route (%)
Cars	Gasoline <1,4 l	PRE ECE	21251	3300	0	0	33	66	123	48	49	3
Cars	Gasoline <1,4 l	ECE 15/00-01	146424	6200	0	0	33	66	123	42	55	3
Cars	Gasoline <1,4 l	ECE 15/02	162229	6600	0	0	33	66	123	41	55	4
Cars	Gasoline <1,4 l	ECE 15/03	307234	7700	0	0	33	66	123	43	53	4
Cars	Gasoline <1,4 l	ECE 15/04	980099	9100	0	0	33	66	123	44	52	4
Cars	Gasoline <1,4 l	Improved Conventional	0	0	0	0	33	66	123	0	0	0
Cars	Gasoline <1,4 l	Open Loop	0	0	0	0	33	66	123	0	0	0
Cars	Gasoline <1,4 l	Euro I - 91/441/EEC	3270	13100	100	100	33	66	123	45	52	3
Cars	Gasoline <1,4 l	Euro II - 94/12/EC	259574	13100	100	100	33	66	123	45	52	3
Cars	Gasoline <1,4 l	Euro III - 98/69/EC Stage2000	168229	14300	100	100	33	66	123	46	50	4
Cars	Gasoline <1,4 l	Euro IV - 98/69/EC Stage2005	526533	13800	100	100	33	66	123	42	54	4
Cars	Gasoline <1,4 l	Euro V (post 2005)	19772	13800	100	100	33	66	123	42	54	4
Cars	Gasoline 1,4 - 2,0 l	PRE ECE	3986	3000	0	0	33	66	123	41	56	3
Cars	Gasoline 1,4 - 2,0 l	ECE 15/00-01	8135	6800	0	0	33	66	123	40	56	4
Cars	Gasoline 1,4 - 2,0 l	ECE 15/02	31723	7200	0	0	33	66	123	40	57	3
Cars	Gasoline 1,4 - 2,0 l	ECE 15/03	43536	8900	0	0	33	66	123	38	59	3
Cars	Gasoline 1,4 - 2,0 l	ECE 15/04	327780	10900	0	0	33	66	123	39	57	4
Cars	Gasoline 1,4 - 2,0 l	Improved Conventional	0	0	0	0	33	66	123	0	0	0
Cars	Gasoline 1,4 - 2,0 l	Open Loop	0	0	0	0	33	66	123	0	0	0
Cars	Gasoline 1,4 - 2,0 l	Euro I - 91/441/EEC	13225	13500	100	100	33	66	123	41	55	4

Cars	Gasoline 1,4 - 2,0 l	Euro II - 94/12/EC	87044	13500	100	100	33	66	123	41	55	4
Cars	Gasoline 1,4 - 2,0 l	Euro III - 98/69/EC Stage2000	102352	14500	100	100	33	66	123	37	58	5
Cars	Gasoline 1,4 - 2,0 l	Euro IV - 98/69/EC Stage2005	240119	14600	100	100	33	66	123	36	60	4
Cars	Gasoline 1,4 - 2,0 l	Euro V (post 2005)	9419	14600	100	100	33	66	123	36	60	4
Cars	Gasoline >2,0 l	PRE ECE	1010	3100	0	0	33	66	123	32	65	3
Cars	Gasoline >2,0 l	ECE 15/00- 01	1847	8000	0	0	33	66	123	33	65	2
Cars	Gasoline >2,0 l	ECE 15/02	4322	8200	0	0	33	66	123	30	68	2
Cars	Gasoline >2,0 l	ECE 15/03	7917	8900	0	0	33	66	123	29	68	3
Cars	Gasoline >2,0 l	ECE 15/04	21457	12200	0	0	33	66	123	31	65	4
Cars	Gasoline >2,0 l	Euro I - 91/441/EEC	328	14100	100	100	33	66	123	28	68	4
Cars	Gasoline >2,0 l	Euro II - 94/12/EC	6657	14100	100	100	33	66	123	28	68	4
Cars	Gasoline >2,0 l	Euro III - 98/69/EC Stage2000	6722	14900	100	100	33	66	123	29	66	5
Cars	Gasoline >2,0 l	Euro IV - 98/69/EC Stage2005	25814	15200	100	100	33	66	123	29	66	5
Cars	Gasoline >2,0 l	Euro V (post 2005)	937	15200	100	100	33	66	123	29	66	5
Cars	Diesel oil <2,0 l	Conventional	199080	13200	100	0	33	66	123	34	62	4
Cars	Diesel oil <2,0 l	Euro I - 91/441/EEC	9504	15900	100	0	33	66	123	37	59	4
Cars	Diesel oil <2,0 l	Euro II - 94/12/EC	45204	15900	100	0	33	66	123	37	59	4
Cars	Diesel oil <2,0 l	Euro III - 98/69/EC Stage2000	487330	16500	100	0	33	66	123	35	61	4
Cars	Diesel oil <2,0 l	Euro IV - 98/69/EC	440169	16800	100	0	33	66	123	36	60	4

		Stage2005										
Cars	Diesel oil <2,0 l	Euro V (post 2005)	15116	16800	100	0	33	66	123	36	60	4
Cars	Diesel oil >2,0 l	Conventional	117204	14700	100	0	33	66	123	32	63	5
Cars	Diesel oil >2,0 l	Euro I - 91/441/EEC	1331	18900	100	0	33	66	123	34	61	5
Cars	Diesel oil >2,0 l	Euro II - 94/12/EC	13764	18900	100	0	33	66	123	34	61	5
Cars	Diesel oil >2,0 l	Euro III - 98/69/EC Stage2000	76326	19100	100	0	33	66	123	31	63	6
Cars	Diesel oil >2,0 l	Euro IV - 98/69/EC Stage2005	76045	19300	100	0	33	66	123	29	64	7
Cars	Diesel oil >2,0 l	Euro V (post 2005)	3942	19300	100	0	33	66	123	29	64	7
Cars	GPL	Conventional	140136	14300	0	0	33	66	123	72	24	4
Cars	GPL	Euro I - 91/441/EEC	384	22700	100	100	33	66	123	70	28	2
Cars	GPL	Euro II - 94/12/EC	25809	22700	100	100	33	66	123	70	28	2
Cars	GPL	Euro III - 98/69/EC Stage2000	22244	22700	100	100	33	66	123	68	30	2
Cars	GPL	Euro IV - 98/69/EC Stage2005	23822	22700	100	100	33	66	123	66	32	2
Cars	GPL	Euro V (post 2005)	106	22700	100	100	33	66	123	66	32	2
Cars	Two stroke	Conventional	27574	?	0	0	33	66	90	?	?	?
Light vehicles	Gasoline <3,5t	Conventional	122381	14100	0	0	33	66	100	54	43	3
Light vehicles	Gasoline <3,5t	Euro I - 93/59/EEC	48	18700	100	100	33	66	100	52	44	4
Light vehicles	Gasoline <3,5t	Euro II - 96/69/EC	44106	18700	100	100	33	66	100	52	44	4
Light vehicles	Gasoline <3.5t	Euro III - 98/69/EC	6945	19200	100	100	33	66	100	57	39	4

		Stage2000										
Light vehicles	Gasoline <3,5t	Euro IV - 98/69/EC Stage2005	8608	19200	100	100	33	66	100	51	45	4
Light vehicles	Gasoline <3,5t	Euro V (post 2005)	103	19200	100	100	33	66	100	51	45	4
Light vehicles	Diesel Oil <3,5 t	Conventional	92414	17300	100	0	33	66	100	48	48	4
Light vehicles	Diesel Oil <3,5 t	Euro I - 93/59/EEC	402	21400	100	0	33	66	100	46	51	3
Light vehicles	Diesel Oil <3,5 t	Euro II - 96/69/EC	45609	21400	100	0	33	66	100	46	51	3
Light vehicles	Diesel Oil <3,5 t	Euro III - 98/69/EC Stage2000	138569	25100	100	0	33	66	100	43	53	4
Light vehicles	Diesel Oil <3,5 t	Euro IV - 98/69/EC Stage2005	91268	25100	100	0	33	66	100	44	52	4
Light vehicles	Diesel Oil <3,5 t	Euro V (post 2005)	1889	25100	100	0	33	66	100	44	52	4
Heavy vehicles	Gasoline >3,5 t	Conventional	3215	11200	0	0	21	53	80	17	80	3
Heavy vehicles	Diesel Oil 3,5 - 7,5 t	Conventional	25934	25800	100	0	21	53	80	21	75	4
Heavy vehicles	Diesel Oil 3,5 - 7,5 t	Euro I - 91/542/EEC Stage I	525	31300	100	0	21	53	80	19	76	5
Heavy vehicles	Diesel Oil 3,5 - 7,5 t	Euro II - 91/542/EEC Stage II	6704	31300	100	0	21	53	80	19	76	5
Heavy vehicles	Diesel Oil 3,5 - 7,5 t	Euro III - 2000 Standards	20553	34800	100	0	21	53	80	18	77	5
Heavy vehicles	Diesel Oil 3,5 - 7,5 t	Euro IV - 2005 Standards	10646	34800	100	0	21	53	80	21	73	6
Heavy vehicles	Diesel Oil 3,5 - 7,5 t	Euro V - 2008	168	34800	100	0	21	53	80	21	73	6

		Standards										
Heavy vehicles	Diesel Oil 7,5 - 16 t	Conventional	97653	21600	100	0	21	53	80	27	69	4
Heavy vehicles	Diesel Oil 7,5 - 16 t	Euro I - 91/542/EEC Stage I	260	35900	100	0	21	53	80	19	74	7
Heavy vehicles	Diesel Oil 7,5 - 16 t	Euro II - 91/542/EEC Stage II	889	35900	100	0	21	53	80	19	74	7
Heavy vehicles	Diesel Oil 7,5 - 16 t	Euro III - 2000 Standards	3637	37200	100	0	21	53	80	16	76	8
Heavy vehicles	Diesel Oil 7,5 - 16 t	Euro IV - 2005 Standards	1350	37200	100	0	21	53	80	20	72	8
Heavy vehicles	Diesel Oil 7,5 - 16 t	Euro V - 2008 Standards	302	37200	100	0	21	53	80	20	72	8
Heavy vehicles	Diesel Oil 16 - 32 t	Conventional	54333	25300	100	0	21	53	80	18	76	6
Heavy vehicles	Diesel Oil 16 - 32 t	Euro I - 91/542/EEC Stage I	868	47700	100	0	21	53	80	16	76	8
Heavy vehicles	Diesel Oil 16 - 32 t	Euro II - 91/542/EEC Stage II	9080	47700	100	0	21	53	80	16	76	8
Heavy vehicles	Diesel Oil 16 - 32 t	Euro III - 2000 Standards	48803	48900	100	0	21	53	80	14	77	9
Heavy vehicles	Diesel Oil 16 - 32 t	Euro IV - 2005 Standards	7264	48900	100	0	21	53	80	15	76	9
Heavy vehicles	Diesel Oil 16 - 32 t	Euro V - 2008 Standards	10507	48900	100	0	21	53	80	15	76	9
Heavy vehicles	Diesel Oil >32t	Conventional	1283	45600	100	0	21	53	80	11	83	6
Heavy vehicles	Diesel Oil >32t	Euro I - 91/542/EEC Stage I	96	48700	100	0	21	53	80	6	88	6

Heavy vehicles	Diesel Oil >32t	Euro II - 91/542/EEC Stage II	256	48700	100	0	21	53	80	6	88	6
Heavy vehicles	Diesel Oil >32t	Euro III - 2000 Standards	8657	49200	100	0	21	53	80	7	86	7
Heavy vehicles	Diesel Oil >32t	Euro IV - 2005 Standards	4631	49200	100	0	21	53	80	5	89	6
Heavy vehicles	Diesel Oil >32t	Euro V - 2008 Standards	506	49200	100	0	21	53	80	5	89	6
Buses	Urban buses	Conventional	10902	45800	100	0	19	59	90	100	0	0
Buses	Urban buses	Euro I - 91/542/EEC Stage I	492	46100	100	0	19	59	90	100	0	0
Buses	Urban buses	Euro II - 91/542/EEC Stage II	330	46100	100	0	19	59	90	100	0	0
Buses	Urban buses	Euro III - 2000 Standards	2184	47800	100	0	19	59	90	100	0	0
Buses	Urban buses	Euro IV - 2005 Standards	1081	47800	100	0	19	59	90	100	0	0
Buses	Urban buses	Euro V - 2008 Standards	72	47800	100	0	19	59	90	100	0	0
Buses	Coaches	Conventional	8071	48300	100	0	21	59	90	5	90	5
Buses	Coaches	Euro I - 91/542/EEC Stage I	348	48800	100	0	21	59	90	5	88	7
Buses	Coaches	Euro II - 91/542/EEC Stage II	348	48800	100	0	21	59	90	5	88	7
Buses	Coaches	Euro III - 2000 Standards	2964	48800	100	0	21	59	90	5	88	7

Buses	Coaches	Euro IV - 2005 Standards	1300	48800	100	0	21	59	90	5	88	7
Buses	Coaches	Euro V - 2008 Standards	58	48800	100	0	21	59	90	5	88	7
Mopeds	<50 cm ³	Conventional	23960	2000	0	0	20	40	40	77	23	0
Mopeds	<50 cm ³	97/24/EC Stage I	30449	2000	100	100	20	40	40	77	23	0
Mopeds	<50 cm ³	97/24/EC Stage II	18927	2000	100	100	20	40	40	77	23	0
Motorcycles	two stroke engines >50 cm ³	Conventional	19756	4000	0	0	40	74	123	62	35	3
Motorcycles	two stroke engines >50 cm ³	97/24/EC	564	4000	0	0	40	74	123	62	35	3
Motorcycles	four stroke engines <250 cm ³	Conventional	7661	4000	0	0	40	74	123	62	35	3
Motorcycles	four stroke engines <250 cm ³	97/24/EC	11050	4000	100	100	40	74	123	62	35	3
Motorcycles	four stroke engines 250 - 750 cm ³	Conventional	25301	4000	0	0	40	74	123	62	35	3
Motorcycles	four stroke engines 250 - 750 cm ³	97/24/EC	15453	4000	100	100	40	74	123	62	35	3
Motorcycles	four stroke engines >750 cm ³	Conventional	6580	4000	0	0	40	74	123	62	35	3
Motorcycles	four stroke engines >750 cm ³	97/24/EC	3568	4000	100	100	40	74	123	62	35	3

Table 3 Activity data for 1990-2009

Technology	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Passenger Cars Gasoline <1,4 l	784727.2616	880521.75	1000147.1	1112847.1	1238782.1	1371902.5	1502759.8	1541148.8	1591470.1	1673330.7	1730130.6
Passenger Cars Gasoline 1,4 - 2,0 l	191901.8699	202501.14	217245.65	239647.42	265316.64	288311.61	313169.38	320589.09	330230.78	347414.66	361388.89
Passenger Cars Gasoline >2,0 l	22847.1175	24023.437	25757.641	28653.043	31749.097	35887.771	40442.982	41199.473	42246.429	43747.043	45010.908
Passenger Cars Diesel <2,0 l	163792.408	181516.87	193071.78	231860.98	278006.91	282265.02	299593.04	303929.97	344928.16	346883.18	346702.13
Passenger Cars Diesel >2,0 l	66369.07793	73566.395	80320.445	92769.143	106786.59	112794.37	121151.65	123273.75	148444.52	149112.11	149039.93
Passenger Cars LPG	42751.17453	47383.144	52068.747	59551.357	67922.616	72397.938	78004.444	79448.999	97466.754	100092.13	102702.11
Light Duty Vehicles Gasoline <3,5t	0	0	0	123271	134137.96	128294.78	136720.35	139937.36	145711.69	152991.18	150536.07
Light Duty Vehicles Diesel <3,5 t	0	0	0	78226.547	85119.577	81455.601	86863.472	94869.414	105318.08	117791.99	124281.15
Heavy Duty Vehicles Diesel 3,5 - 7,5 t	0	0	0	18010.121	0	0	23061	46038	0	0	0
Heavy Duty Vehicles Diesel 7,5 - 16 t	0	0	0	38801	41488	20457.449	44269.757	0	50871.491	0	0
Heavy Duty Vehicles Diesel 16 - 32 t	0	0	0	56391	30787	86638.808	81238.187	83806.288	88113.309	93593.072	93389.254
Heavy Duty Vehicles Diesel >32t	0	0	0	9856	10773	29178	11111	32244.671	34148	36516	36680
Buses Urban Buses	17333	19102	21510	23139	24543.197	25790	26626	24536.823	24681	24711	24662
Buses Coaches	10939	12053	13569	14592	15473.733	16256	16598	15352.841	15427	15430	15398
Mopeds <50 cm³	206673.3893	208046.38	219727	213478.73	205357.14	205705	205734.17	205734.17	149235	143305.67	137540
Motorcycles 2-stroke >50 cm³	27256.20561	27923.471	28111	29379.612	31330.099	31707	31016.617	31016.617	25548	26097	26362
Motorcycles 4-stroke <250 cm³	30468.46485	31179.149	31327	32655.202	34709.171	35015	34547.255	34547.255	28934	28071	27190
Motorcycles 4-stroke 250 - 750 cm³	41874.30496	42745.023	42844.96	44562.276	47293.903	47741	47509.855	47509.855	39805	39266	38716
Motorcycles 4-stroke >750 cm³	6371.183497	6526.3851	6568.2565	6861.3212	7311.8091	7394	7246.6556	7246.6556	6052.3114	5675.8206	5289.5344

Table 3(continued) Activity data for 1990-2009

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Passenger Cars Gasoline <1,4 l									
Passenger Cars Gasoline 1,4 - 2,0 l	1813569.587	1849082.1	1919498.7	2008937.3	2002033	2217718	2069423	2251131	2366146
Passenger Cars Gasoline >2,0 l	373810.7935	391721.42	406174.78	428530.19	414814	487681	475563	634470	750199
Passenger Cars Diesel <2,0 l	46191.73598	47965.994	49900.657	48055	54467	59014	58783	69072	74144
Passenger Cars Diesel >2,0 l	346842.2066	377020.29	396694.53	397563	367563	532404	731816	975948	904515
Passenger Cars LPG	150121.5028	155364.22	160352.64	147718	161935	183351	202423	248975	154850
Light Duty Vehicles Gasoline <3,5t	106290.3701	106521.15	107500.67	109288	110550	117529	143490	153369	294461
Light Duty Vehicles Diesel <3,5 t	142410.6105	127106.17	120456.02	144586	179736	189719	164501	170765	171208
Heavy Duty Vehicles Diesel 3,5 - 7,5 t	129514.9692	116743.25	113611.98	152174	199977	243952	270149	325734	259965
Heavy Duty Vehicles Diesel 7,5 - 16 t	0	0	0	0	55062	64893	52256	61946	62606
Heavy Duty Vehicles Diesel 16 - 32 t	0	0	0	0	57798	62188	95596	97976	98716
Heavy Duty Vehicles Diesel >32t	90787.30231	84670	84490.297	128622.96	116282	124281	98931	114915	120881
Buses Urban Buses	35727	33442.584	33381.526	4555	3078	4992	8886	13123	14778
Buses Coaches	24239.61461	23795.226	24016	26385	12490	13408	12098	13349	14428
Mopeds <50 cm³	15118	14823	14848	16758	7883	8407	10109	12347	12060
Motorcycles 2-stroke >50 cm³	131969	109462	86311	130263	3562	4860	36008	59499	68332
Motorcycles 4-stroke <250 cm³	26787	27244	26578	26968	9001	9001	8853	8853	8853
Motorcycles 4-stroke 250 - 750 cm³	26295	25390.419	24417	23526	10026	22273	40363	59106	66779
Motorcycles 4-stroke >750 cm³	38158	37594	36724	0	13788	17235	27967	38141	43304

Figure 1 Type population analysis Mopeds and Motorcycles

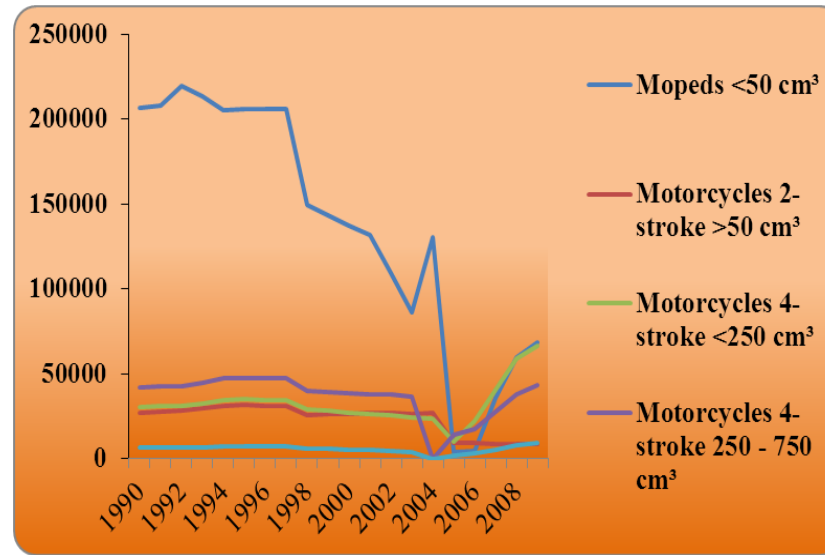
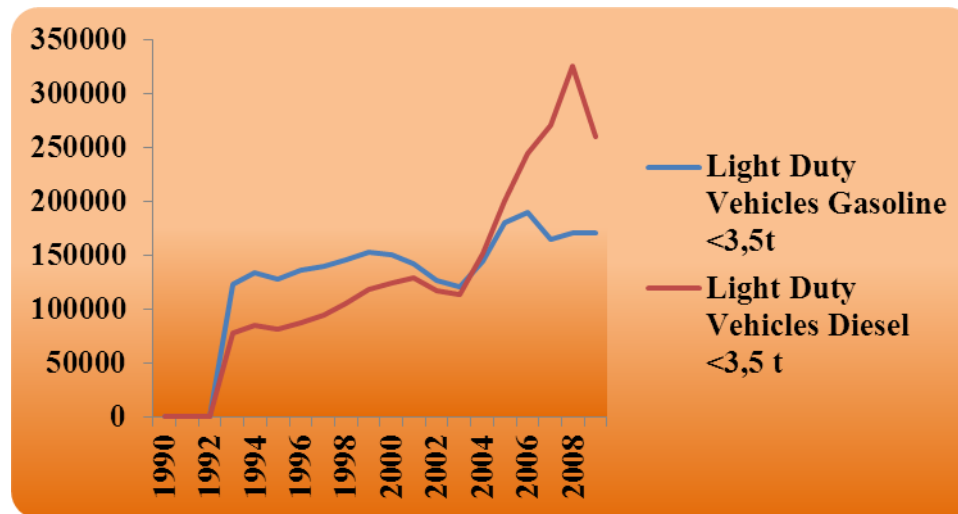


Figure 2 Type population analysis Light Duty Vehicle Gasoline and Diesel



The table below provides a centralized gases emissions with greenhouse effect, the reports generated by the Copert III model.

Table 3 Emissions for Road Transport

CO (t)

	2010		
	Gasoline	Diesel Oil	LPG
Passenger cars = TOTAL			
Gasoline< 1.4	259008		
1.4-2.0	79481		
> 2.0	7507		
Diesel < 2.0		8140	
> 2.0		2356	
LPG			11566
2 Stroke	1262		
Light Duty Vehicles - Gasoline	46607		
-			
Diesel		4729	
Heavy Duty Vehicles - Diesel; Gasoline	2072	17327	
Buses		4713	
Mopeds	1114		
Motorcycles	6297		
Sum/fuel type	403348	37265	11566
Emissions sum/year		452179	
Sum emissions/year =Report	403.348	37.265	11.566

SO₂ (t)

	2010		
	Gasoline	Diesel Oil	LPG
Passenger cars = TOTAL			
Gasoline< 1.4	16		
1.4-2.0	7		
> 2.0	1		
Diesel < 2.0		13	
> 2.0		3	
LPG			0
2 Stroke	0		
Light Duty Vehicles - Gasoline	3		
-			
Diesel		8	
Heavy Duty Vehicles - Diesel; Gasoline	0	28	
Buses		5	
Mopeds	0		
Motorcycles	0		
Sum/fuel type	27	57	0
Emissions sum/year	84	84	
Sum emissions/year =Report	0.027	0.057	0

CO2 (t)

	2010		
	Gasoline	Diesel Oil	LPG
Passenger cars = TOTAL			
Gasoline< 1.4	2510486		
1.4-2.0	1191938		
> 2.0	124339		
Diesel < 2.0		2061450	
> 2.0		538705	
LPG			61669
2 Stroke	13628		
Light Duty Vehicles - Gasoline	451503		
- Diesel		1259927	
Heavy Duty Vehicles - Diesel; Gasoline	10049	4423343	
Buses		826858	
Mopeds	6271		
Motorcycles	17948		
Sum/fuel type	4326162	9110283	61669
Emissions sum/year		13498114	
Sum emissions/year =Report	4326.162	9110.283	61.669

N₂O (t)

	2010		
	Gasoline	Diesel Oil	LPG
Passenger cars = TOTAL			
Gasoline< 1.4	497		
1.4-2.0	216		
> 2.0	18		
Diesel < 2.0		511	
> 2.0		133	
LPG			55
2 Stroke	0		
Light Duty Vehicles - Gasoline	51		
- Diesel		143	
Heavy Duty Vehicles - Diesel; Gasoline	0	306	
Buses		40	
Mopeds	0		
Motorcycles	1		
Sum/fuel type	783	1133	55
Emissions sum/year		1971	
Sum emissions/year =Report	0.783	1.133	0.055

CH₄ (t)

	2010		
	Gasoline	Diesel Oil	LPG
Passenger cars = TOTAL			
Gasoline< 1.4	1837		
1.4-2.0	677		
> 2.0	51		
Diesel < 2.0		100	
> 2.0		28	
LPG			183
2 Stroke	8		
Light Duty Vehicles - Gasoline	301		
- Diesel		40	
Heavy Duty Vehicles - Diesel;Gasoline	4	428	
Buses		146	
Mopeds	14		
Motorcycles	68		
Sum/fuel type	2960	742	183
Emissions sum/year		5920	
Sum emissions/year =Report	2.96	0.742	0.183

NMVOC(t)

	2010		
	Gasoline	Diesel Oil	LPG
Passenger cars = TOTAL			
Gasoline< 1.4	42408		
1.4-2.0	13195		
> 2.0	1195		
Diesel < 2.0		1567	
> 2.0		497	
LPG			2537
2 Stroke	1002		
Light Duty Vehicles - Gasoline	5887		
- Diesel		974	
Heavy Duty Vehicles - Diesel;Gasoline	201	9688	
Buses		1724	
Mopeds	682		
Motorcycles	1081		
Sum/fuel type	65651	14450	2537
Emissions sum/year		82638	
Sum emissions/year =Report	65.651	14.45	2.537

NO_x (t)

	2010		
	Gasoline	Diesel Oil	LPG
Passenger cars = TOTAL			
Gasoline< 1.4	27665		
1.4-2.0	11347		
> 2.0	1158		
Diesel < 2.0		8644	
> 2.0		2868	
LPG			4508
2 Stroke	61		
Light Duty Vehicles - Gasoline	5222		
- Diesel		8863	
Heavy Duty Vehicles - Diesel; Gasoline	252	47236	
Buses		15160	
Mopeds	3		
Motorcycles	65		
Sum/fuel type	45773	82771	4508
Emissions sum/year		133052	
Sum emissions/year =Report	45.773	82.771	4.508

2.2.3 Domestic and International Navigation

The values for fuels consumptions, by 1989-2009 are presented in Table 4.

Table 4 Fuels consumptions

	Fuels	TJ
1989	residual oil	18309
	residual oil for domestic navigation	2925.72
	residual oil for international navigation	15383.28
	diesel oil	2823.64
	diesel oil for domestic navigation	451.21
	diesel oil for international navigation	2372.43
	gasoline	NO
	gasoline for domestic navigation	NO
	gasoline for international navigation	NO
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	15.98
	goods international %	84.02

	Fuels	TJ
1990	residual oil	10915
	residual oil for domestic navigation	1900.24
	residual oil for international navigation	9014.76
	diesel oil	3080.6
	diesel oil for domestic navigation	536.31
	diesel oil for international navigation	2544.29
	gasoline	NO
	gasoline for domestic navigation	0
	gasoline for international navigation	0
	other fuels	NO
	other fuels domestic	0
	other fuels international	0

	goods domestic %	17.41
	goods international %	82.59
	Fuels	TJ
	residual oil	14964.00
	residual oil for domestic navigation	2819.08
	residual oil for international navigation	12144.92
	diesel oil	2591.72
	diesel oil for domestic navigation	488.26
	diesel oil for international navigation	2103.46
	gasoline	NO
	gasoline for domestic navigation	0.00
	gasoline for international navigation	0.00
	other fuels	NO
	other fuels domestic	0.00
	other fuels international	0.00
	goods domestic %	18.84
	goods international %	81.16

	Fuels	TJ
	residual oil	9053.70
	residual oil for domestic navigation	1835.08
	residual oil for international navigation	7218.62
	diesel oil	3870.55
	diesel oil for domestic navigation	784.51
	diesel oil for international navigation	3086.04
	gasoline	NO
	gasoline for domestic navigation	0.00
	gasoline for international navigation	0.00
	other fuels	NO
	other fuels domestic	0.00
	other fuels international	0.00
	goods domestic %	20.27
	goods international %	79.73

1993	Fuels	TJ
	residual oil	2718.57
	residual oil for domestic navigation	589.89
	residual oil for international navigation	2128.68
	diesel oil	2776.41
	diesel oil for domestic navigation	1054.63
	diesel oil for international navigation	1721.78
	gasoline	9.35
	gasoline for domestic navigation	2.03
	gasoline for international navigation	7.32
	other fuels	NO
	other fuels domestic	0
	other fuels international	0
	goods domestic %	21.70
	goods international %	78.30

1994	Fuels	TJ
	residual oil	3071.26
	residual oil for domestic navigation	710.33
	residual oil for international navigation	2360.93
	diesel oil	2215.29
	diesel oil for domestic navigation	512.36
	diesel oil for international navigation	1702.93
	gasoline	1.88
	gasoline for domestic navigation	0.43
	gasoline for international navigation	1.44
	other fuels	NO
	other fuels domestic	0
	other fuels international	0
	goods domestic %	23.13
	goods international %	76.87

1995	Fuels	TJ
	residual oil	2081.53
	residual oil for domestic navigation	511.18
	residual oil for international navigation	1570.35
	diesel oil	2113.50
	diesel oil for domestic navigation	519.03
	diesel oil for international navigation	1594.47
	gasoline	1.41
	gasoline for domestic navigation	0.35
	gasoline for international navigation	1.06
	other fuels	NO
	other fuels domestic	0
	other fuels international	0
	goods domestic %	24.56
	goods international %	75.44

1996	Fuels	TJ
	residual oil	3534.69
	residual oil for domestic navigation	775.10
	residual oil for international navigation	2759.59
	diesel oil	2498.47
	diesel oil for domestic navigation	547.87
	diesel oil for international navigation	1950.60
	gasoline	0.64
	gasoline for domestic navigation	0.14
	gasoline for international navigation	0.50
	other fuels	NO
	other fuels domestic	0
	other fuels international	0
	goods domestic %	21.93
	goods international %	78.07

1997	Fuels	TJ
	residual oil	9419.48
	residual oil for domestic navigation	2187.56
	residual oil for international navigation	7231.93
	diesel oil	4497.93
	diesel oil for domestic navigation	1044.59
	diesel oil for international navigation	3453.34
	gasoline	33.61
	gasoline for domestic navigation	7.80
	gasoline for international navigation	25.80
	other fuels	NO
	other fuels domestic	0
	other fuels international	0
	goods domestic %	23.22
	goods international %	76.78

1998	Fuels	TJ
	residual oil	9569.29
	residual oil for domestic navigation	2006.26
	residual oil for international navigation	7563.03
	diesel oil	3853.65
	diesel oil for domestic navigation	807.94
	diesel oil for international navigation	3045.71
	gasoline	9.79
	gasoline for domestic navigation	2.05
	gasoline for international navigation	7.73
	other fuels	NO
	other fuels domestic	0
	other fuels international	0
	goods domestic %	20.97
	goods international %	79.03

1999	Fuels	TJ
	residual oil	6332.35
	residual oil for domestic navigation	2705.92
	residual oil for international navigation	3626.42
	diesel oil	2542.60
	diesel oil for domestic navigation	1086.49
	diesel oil for international navigation	1456.10
	gasoline	11.52
	gasoline for domestic navigation	4.92
	gasoline for international navigation	6.59
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	42.73
	goods international %	57.27

2000	Fuels	TJ
	residual oil	2418.98
	residual oil for domestic navigation	980.89
	residual oil for international navigation	1438.09
	diesel oil	2137.38
	diesel oil for domestic navigation	866.70
	diesel oil for international navigation	1270.67
	gasoline	21.86
	gasoline for domestic navigation	8.86
	gasoline for international navigation	12.99
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	40.55
	goods international %	59.45

2001	Fuels	TJ
	residual oil	0.00
	residual oil for domestic navigation	0.00
	residual oil for international navigation	0.00
	diesel oil	518.58
	diesel oil for domestic navigation	193.22
	diesel oil for international navigation	325.36
	gasoline	22.00
	gasoline for domestic navigation	8.20
	gasoline for international navigation	13.81
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	37.26
	goods international %	62.74

2002	Fuels	TJ
	residual oil	147.67
	residual oil for domestic navigation	49.99
	residual oil for international navigation	97.68
	diesel oil	1281.17
	diesel oil for domestic navigation	433.69
	diesel oil for international navigation	847.48
	gasoline	25.96
	gasoline for domestic navigation	8.79
	gasoline for international navigation	17.17
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	33.85
	goods international %	66.15

2003	Fuels	TJ
	residual oil	0.00
	residual oil for domestic navigation	0.00
	residual oil for international navigation	0.00
	diesel oil	534.17
	diesel oil for domestic navigation	173.77
	diesel oil for international navigation	360.40
	gasoline	24.47
	gasoline for domestic navigation	7.96
	gasoline for international navigation	16.51
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	32.53
	goods international %	67.47

2004	Fuels	TJ
	residual oil	29.04
	residual oil for domestic navigation	10.54
	residual oil for international navigation	18.50
	diesel oil	864.06
	diesel oil for domestic navigation	313.65
	diesel oil for international navigation	550.41
	gasoline	19.25
	gasoline for domestic navigation	6.99
	gasoline for international navigation	12.26
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	36.30
	goods international %	63.70

2005	Fuels	TJ
	residual oil	62.76
	residual oil for domestic navigation	21.88
	residual oil for international navigation	40.88
	diesel oil	1718.09
	diesel oil for domestic navigation	599.10
	diesel oil for international navigation	1118.99
	gasoline	2.43
	gasoline for domestic navigation	0.85
	gasoline for international navigation	1.58
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	34.87
	goods international %	65.13

2006	Fuels	TJ
	residual oil	48.98
	residual oil for domestic navigation	15.20
	residual oil for international navigation	33.79
	diesel oil	1674.00
	diesel oil for domestic navigation	519.31
	diesel oil for international navigation	1154.69
	gasoline	3.26
	gasoline for domestic navigation	1.01
	gasoline for international navigation	2.25
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	31.02
	goods international %	68.98

2007	Fuels	TJ
	residual oil	566.97
	residual oil for domestic navigation	165.30
	residual oil for international navigation	401.67
	diesel oil	3494.86
	diesel oil for domestic navigation	1018.92
	diesel oil for international navigation	2475.94
	gasoline	11.06
	gasoline for domestic navigation	3.22
	gasoline for international navigation	7.83
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	29.15
	goods international %	70.85

2008	Fuels	TJ
	residual oil	2096.54
	residual oil for domestic navigation	587.92
	residual oil for international navigation	1508.62
	diesel oil	3720.92
	diesel oil for domestic navigation	1043.43
	diesel oil for international navigation	2677.49
	gasoline	21.99
	gasoline for domestic navigation	6.17
	gasoline for international navigation	15.83
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	28.04
	goods international %	71.96

2009	Fuels	TJ
	residual oil	0.03
	residual oil for domestic navigation	0.00
	residual oil for international navigation	0.02
	diesel oil	2003.55
	diesel oil for domestic navigation	324.16
	diesel oil for international navigation	1679.39
	gasoline	12.85
	gasoline for domestic navigation	2.08
	gasoline for international navigation	10.77
	other fuels	NO
	other fuels domestic	NO
	other fuels international	NO
	goods domestic %	16.18
	goods international %	83.82