
AIR EMISSIONS IN FRANCE

Mainland France

particulate matter

(Emissions_FRmt_PMEN)

Note : the data presented in this document are revised annually in order to take into account the continuous improvements in knowledge, methodologies and reporting rules. Users are advised to ensure they are working from the most recent updates which may be published without prior notice.

Figures and data tables are not translated.

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(last updated May 2008)



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Substances and index currently monitored

Particulate matter : Total suspended particulates (TSP), Fine particulates with an equivalent aerodynamic diameter of less than 10 µm (PM₁₀), 2.5 µm (PM_{2.5}) and 1.0 µm (PM_{1.0}).

Emissions in relation to key indicators such as population, area, gross domestic product (GDP), primary energy consumption, etc.

Emissions are presented in the form of charts for each substance and the main source categories in five-year intervals until 2000 and, thereafter, annually. The years corresponding to the maximum and minimum values are also included. Results are provisional for 2007. More detailed data highlighting various parameters such as sectors, fuels, etc. are available (by downloading the complete report : www.citepa.org/emissions/nationale/index_en.htm). Data are also available on CD-ROM at CITEPA.

1 Total suspended particulates – TSP

Source : CITEPA / CORALIE / SECTEN format – last updated 28 february 2008

Emissions		Variations	
Survey period :	from 1990		
Emissions in 2006 :	1 156 kt	Variation 2006 / 1990 :	-18%
Maximum observed :	1 468 kt in 1991	Variation 2006 / maximum :	-21%
Minimum observed :	1 156 kt in 2006	Variation 2006 / minimum :	0 %

Main emitters

Main emitters in 2006 (sub-sectors ≥ 95 % of total emissions) :

1 - Crops	38 %
2 - Construction	15 %
3 - Residential	12 %
4 - Non metallic mineral, construction materials	8.6%
5 - Other agriculture	4.6%
6 - Other manufacturing industry	4.0%
7 - Livestock	3.1%
8 - Diesel-engined heavy duty vehicle	2.6%
9 - Catalysed diesel-engined passenger cars	2.1%
10 - Non catalysed diesel-engined passenger cars	1.1%
11 - Catalysed diesel-engined light duty vehicles	1.0%
12 - Food and drink industry	1.0%
13 - Catalysed gasoline-engined passenger cars	1.0%
14 - Chemical industry	0.7%

Comments

TSP emissions amounted for 1 156 kt in 2006. These emissions decreased since 1990, even if the year 1991 was exceptional (highest level during the surveyed period). Thus, between 1990 and 2006, emissions reduced by 18%, i.e. -254 kt.

Among the emitting sectors, two essentially contributed to the TSP emissions as follows in importance order :

- agriculture/forestry with 47% of the emissions in mainland France in 2006,
- manufacturing industry with 30%.

The other sectors contributed to a lesser extent (maximum 12% for residential/tertiary).

Construction with public works, and crops were the major sources with respectively 18% and 37% of total TSP emissions in mainland France in 2006.

Combustion of solid mineral fuels, heavy fuel oil and biomass was also an important source of TSP emissions.

TSP

EMISSIONS DANS L'AIR EN FRANCE METROPOLITAINE (unité Gg = kt)

Source CITEPA / CORALIE / format SECTEN

mise à jour : 28 février 2008

Secten_niv_1_PM-d/TSP.xls

Année	Transformation énergie	Industrie manufacturière	Résidentiel / tertiaire	Agriculture/sylviculture hors UTCF (**)	Transport routier	Autres transports (*)	UTCf (**)	TOTAL	Hors total (*)
1990	68	414	239	571	105	12,3	0	1 410	115
1991	68	412	291	572	113	12,1	0	1 468	33
1995	48	371	238	530	125	11,7	0	1 324	49
2000	33	377	194	549	117	12,2	0	1 283	49
2001	27	372	180	544	118	12,4	0	1 253	38
2002	25	360	158	547	114	12,8	0	1 218	101
2003	25	388	164	535	113	12,6	0	1 238	98
2004	18	389	158	547	111	12,5	0	1 236	38
2005	19	353	150	538	104	12,0	0	1 176	47
2006	16	353	139	534	103	11,9	0	1 156	29
2007 (e)	16	353	131	534	103	12,0	0	1 148	30

(*) selon définitions de la CEE-NU - les émissions répertoriées hors total ne sont pas incluses, à savoir les émissions maritimes et aériennes internationales, ainsi que les émissions des sources biotiques des forêts et les émissions des sources non-anthropiques.

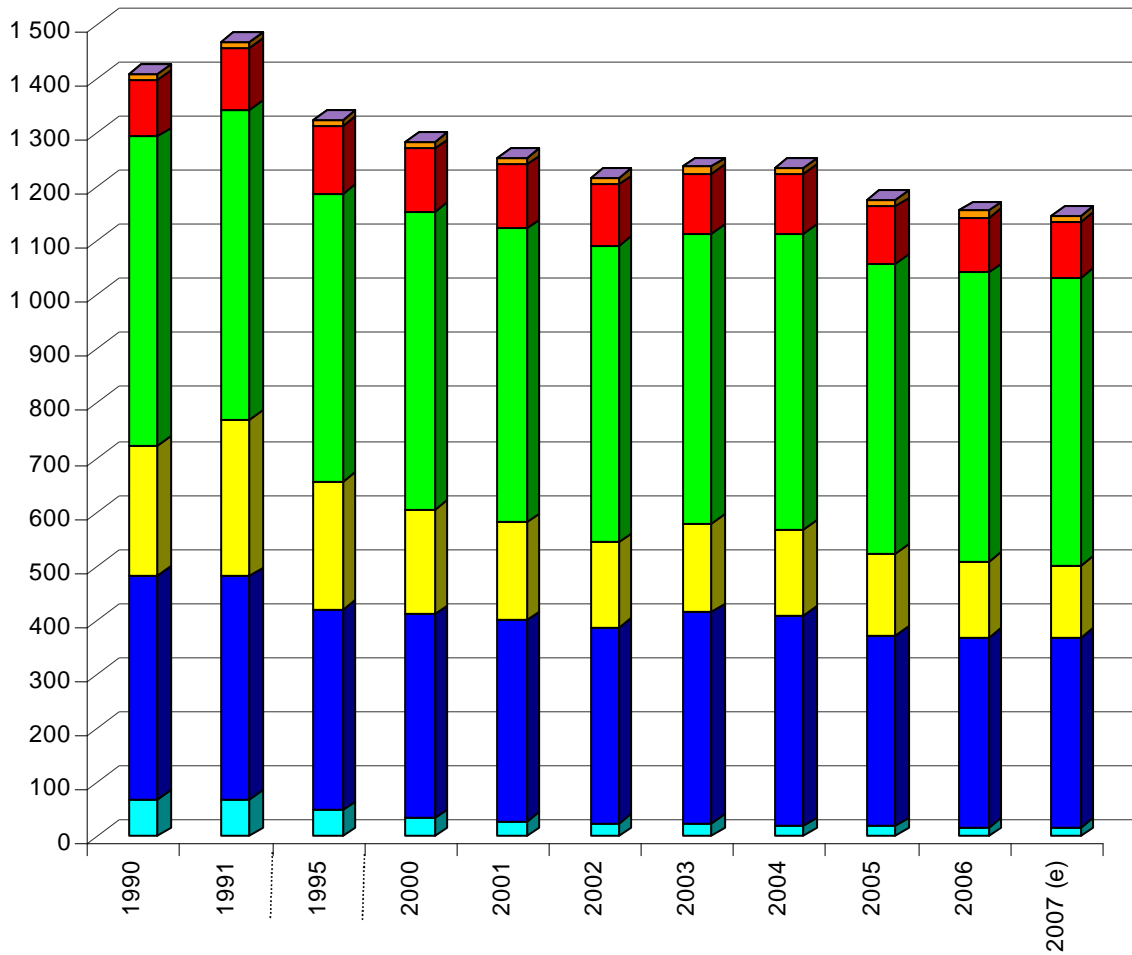
(**) Utilisation des Terres, leur Changement et la Forêt

(e) estimation préliminaire

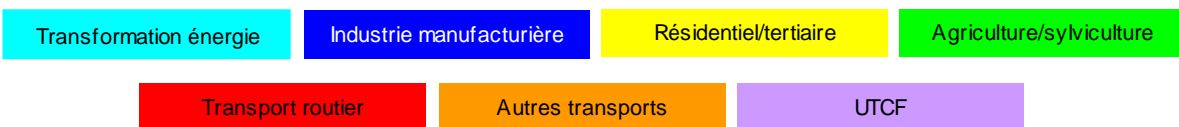
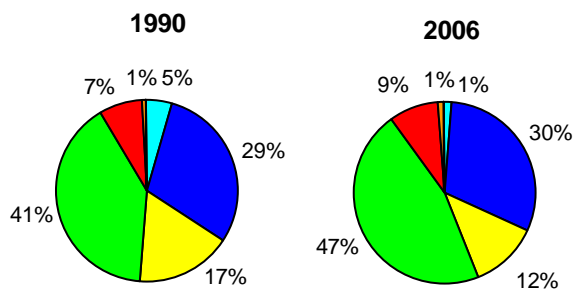
Avertissement : ces valeurs sont régulièrement révisées et complétées afin de tenir compte de l'amélioration permanente des connaissances, des méthodes d'estimation et des règles de restitution. Les utilisateurs sont invités à s'assurer de l'existence de mises à jour plus récentes.

TSP

Emissions atmosphériques par secteur en France métropolitaine
en kt



(e) estimation préliminaire



2 Fine particulate matter less than 10 µm – PM₁₀

Source : CITEPA / CORALIE / SECTEN format – last updated 28 february 2008

Emissions		Variations	
Survey period :	from 1990		
Emissions in 2006 :	488 kt	Variation 2006 / 1990 :	-29%
Maximum observed :	744 kt in 1991	Variation 2006 / maximum :	-35%
Minimum observed :	488 kt in 2006	Variation 2006 / minimum :	0 %

Main emitters

Main emitters in 2006 (sub-sectors ≥ 95 % of total emissions) :

1 - Residential	26 %
2 - Crops	20 %
3 - Non metallic mineral, construction materials	13 %
4 - Other agriculture	7.1 %
5 - Construction	6.8 %
6 - Other manufacturing industry	3.7 %
7 - Livestock	3.2 %
8 - Diesel-engined heavy duty vehicles	2.9 %
9 - Catalysed diesel-engined passenger cars	2.5 %
10 - Non-catalysed diesel-engined passenger cars	1.9 %
11 - Catalysed diesel-engined light duty vehicles	1.3 %
12 - Iron and steel industry	1.2 %
13 - Non-catalysed diesel-engined light duty vehicles	1.2 %
14 - Food and drink industry	1.1 %
15 - Electricity production	1.1 %
16 - Tertiary, commercial and institutional	0.9 %
17 - Paper, cardboard	0.8 %

Comments

PM₁₀ emissions represented 488 kt in mainland France in 2006. These emissions decreased by 29% between 1990 and 2006 (a diminution of 202 kt), despite of the year 1991 which was exceptionally high (maximum observed during the survey period).

Many sources were concerned by these emissions, such as by order of importance :

- agriculture/forestry (30%), crops in particular,
- manufacturing industry (28%), especially construction and public works, and also quarrying,
- residential/tertiary (27%), mainly coal, fuel oil and wood combustion,
- road transport (11%),
- energy conversion (2%),
- other transports (all except road) with 2%.

The distribution is quite stable along the years.

A decrease of the emissions during the 1990-2006 period was observed in every sector but the other transport (all except road) one. This diminution is partly due to improvements in techniques to limit dust in iron and steel industry, and for biomass combustion.

PM₁₀

EMISSIONS DANS L'AIR EN FRANCE METROPOLITAINE (unité Gg = kt)

Source CITEPA / CORALIE / format SECTEN

mise à jour : 28 février 2008

Secten_niv_1_PM-d/PM10.xls

Année	Transformation énergie	Industrie manufacturière	Résidentiel / tertiaire	Agriculture/sylviculture hors UTCF (**)	Transport routier	Autres transports (*)	UTCf (**)	TOTAL	Hors total (*)
1990	59	167	227	162	66	8,6	0	690	81
1991	59	165	276	163	73	8,4	0	744	26
1995	41	147	226	152	82	8,3	0	655	36
2000	26	142	184	156	70	8,4	0	588	38
2001	21	138	171	154	69	8,7	0	562	30
2002	19	134	150	155	65	9,1	0	532	71
2003	19	138	155	149	63	9,1	0	533	70
2004	12	141	150	154	61	9,0	0	527	31
2005	13	134	141	150	54	8,8	0	502	37
2006	11	136	131	148	52	8,7	0	488	25
2007 (e)	11	136	123	148	52	8,8	0	480	26

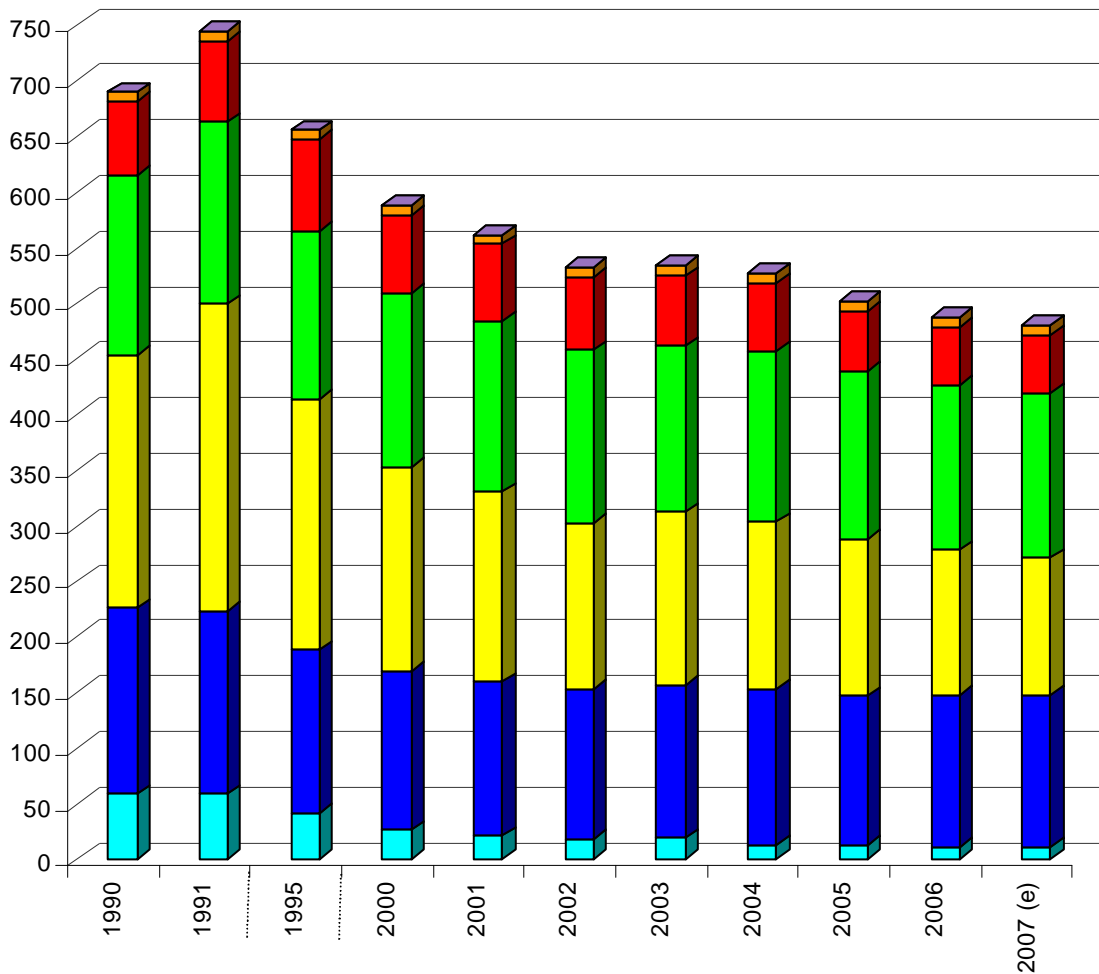
(*) selon définitions de la CEE-NU - les émissions répertoriées hors total ne sont pas incluses, à savoir les émissions maritimes et aériennes internationales, ainsi que les émissions des sources biotiques des forêts et les émissions des sources non-anthropiques.

(**) Utilisation des Terres, leur Changement et la Forêt

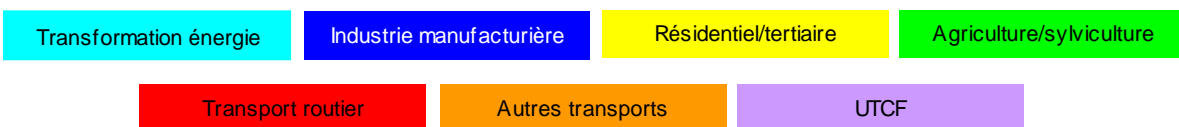
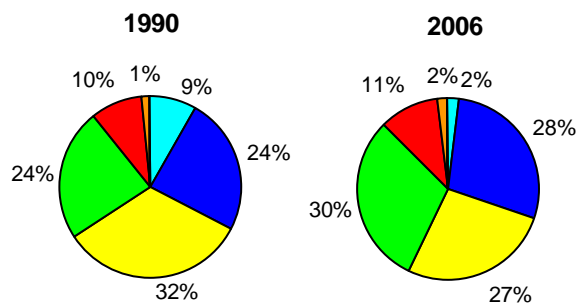
(e) estimation préliminaire

Avertissement : ces valeurs sont régulièrement révisées et complétées afin de tenir compte de l'amélioration permanente des connaissances, des méthodes d'estimation et des règles de restitution. Les utilisateurs sont invités à s'assurer de l'existence de mises à jour plus récentes.

PM₁₀ Emissions atmosphériques par secteur en France métropolitaine en kt



(e) estimation préliminaire



3 Fine particulate matter less than 2.5 µm – PM_{2.5}

Source : CITEPA / CORALIE / SECTEN format – last updated 28 february 2008

Emissions		Variations	
Survey period :	from 1990		
Emissions in 2006 :	316 kt	Variation 2006 / 1990 :	-35 %
Maximum observed :	534 kt in 1991	Variation 2006 / maximum :	-41 %
Minimum observed :	316 kt in 2006	Variation 2006 / minimum :	0 %

Main emitters

Main emitters in 2006 (sub-sectors ≥ 95 % of total emissions) :

1 - Residential	39 %
2- Non-metallic mineral, construction materials	15 %
3 - Other agriculture	8.5 %
4 - Crops	7.3 %
5 - Other manufacturing industry	4.4 %
6 - Construction	3.7 %
7 - Diesel-engined heavy duty	3.0 %
8 - Catalysed diesel-engined passenger cars	2.8 %
9 - Non-catalysed diesel-engined passenger cars	2.4 %
10 - Catalysed diesel-engined light duty vehicles	1.6 %
11 - Non-catalysed diesel-engined light duty vehicles	1.5 %
12 - Tertiary, commercial and institutional	1.4 %
13 - Iron and steel industry	1.3 %
14 - Livestock	1.1 %
15 - Inland navigation	1.0 %
16 - Electricity production	0.9 %

Comments

In 2006, emissions of fine particulate matter less than 2.5 μm ($\text{PM}_{2.5}$) amounted to 316 kt. These emissions have fallen by 34% between 1990 and 2006 (a reduction of 166 kt), despite of the year 1991 which was exceptionally high (maximum observed during the survey period), mainly due to a high consumption of wood in the residential/tertiary sector.

These emissions were distributed in most of the sectors. The three main sources were, by importance order :

- residential/tertiary with 41% of total emissions in mainland France in 2006,
- manufacturing industry with 26%,
- agriculture/forestry with 17%.

Coal, fuel oil and wood combustion, quarrying, construction and public works and crops are responsible for a large proportion of total emissions.

A decrease during the 1990-2006 period was observed in every sector but the other transport (all transports except road) one. This diminution is partly due to improvements in techniques to limit dust in iron and steel industry, and for biomass combustion.

PM_{2,5}

EMISSIONS DANS L'AIR EN FRANCE METROPOLITAINE (unité Gg = kt)

Source CITEPA / CORALIE / format SECTEN

mise à jour : 28 février 2008

Secten_niv_1_PM-d/PM2_5.xls

Année	Transformation énergie	Industrie manufacturière	Résidentiel / tertiaire	Agriculture/sylviculture hors UTCF (**)	Transport routier	Autres transports (*)	UTCf (**)	TOTAL	Hors total (*)
1990	43	96	222	61	52	6,5	0	482	75
1991	42	94	270	63	58	6,4	0	534	24
1995	29	86	221	57	66	6,3	0	465	34
2000	17	84	180	59	54	6,2	0	400	35
2001	13	81	167	57	53	6,5	0	378	28
2002	11	80	147	58	50	6,8	0	352	66
2003	12	80	152	54	48	6,9	0	353	65
2004	7	83	147	58	46	6,8	0	347	28
2005	7	81	138	55	40	6,7	0	328	34
2006	6	83	128	54	38	6,7	0	316	23
2007 (e)	7	83	121	54	37	6,7	0	307	24

(*) selon définitions de la CEE-NU - les émissions répertoriées hors total ne sont pas incluses, à savoir les émissions maritimes et aériennes internationales, ainsi que les émissions des sources biotiques des forêts et les émissions des sources non-anthropiques.

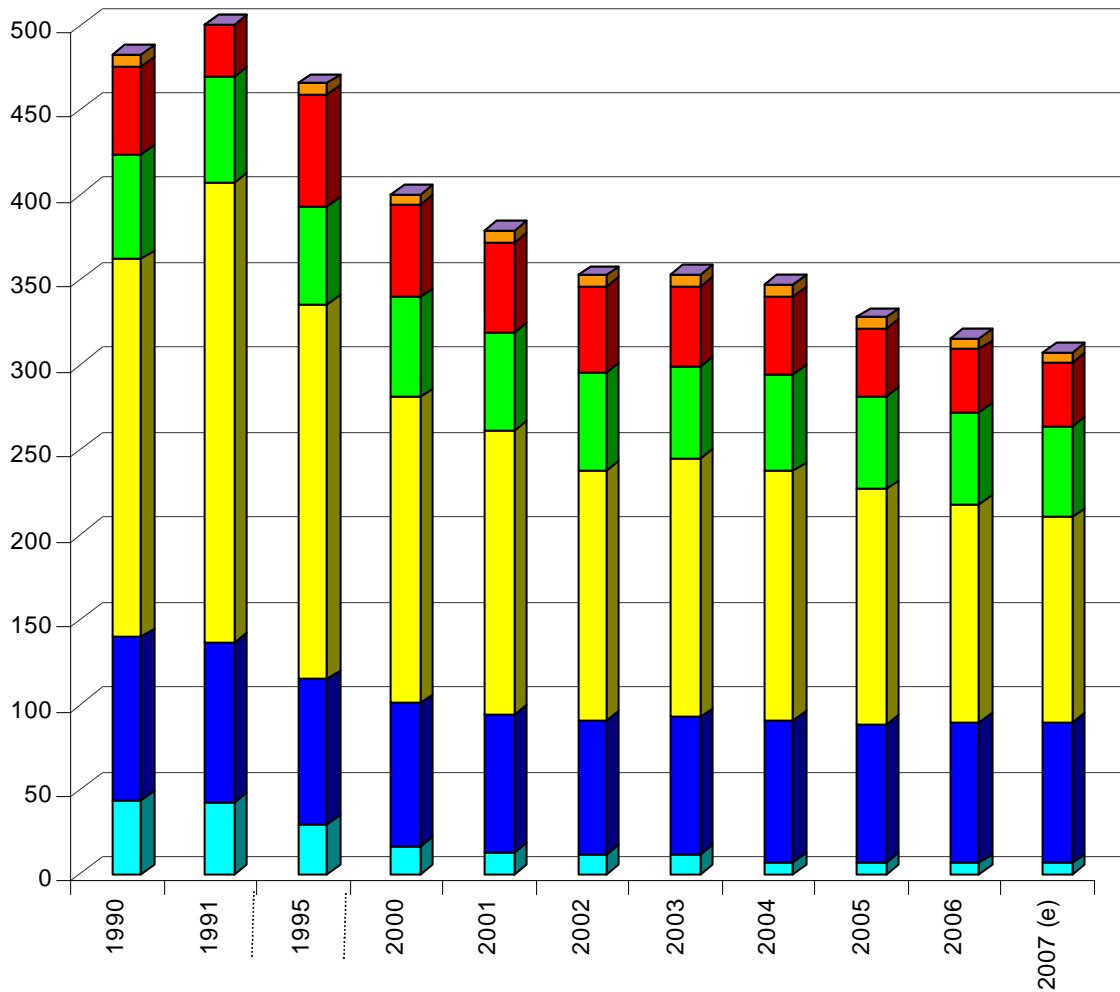
(**) Utilisation des Terres, leur Changement et la Forêt

(e) estimation préliminaire

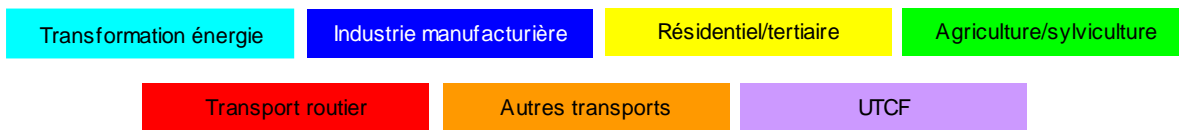
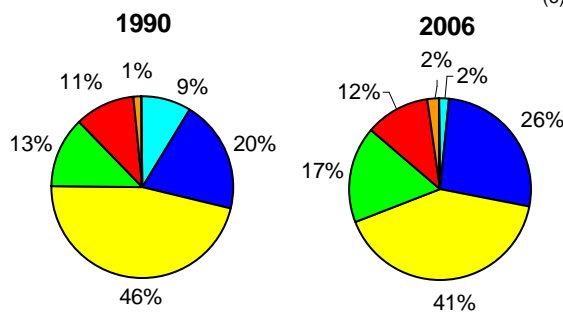
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PM_{2,5}

Emissions atmosphériques par secteur en France métropolitaine en kt



(e) estimation préliminaire



4 Fine particulate matter less than 1.0 μm – PM_{1.0}

Source : CITEPA / CORALIE / SECTEN format – last updated 28 february 2008

Emissions		Variations	
Survey period :	from 1990		
Emissions in 2006 :	190 kt	Variation 2006 / 1990 :	-44 %
Maximum observed :	392 kt in 1991	Variation 2006 / maximum :	-52 %
Minimum observed :	190 kt in 2006	Variation 2006 / minimum :	0 %

Main emitters

Main emitters in 2006 (sub-sectors ≥ 95 % of total emissions) :

1 - Residential	64 %
2 - Other agriculture	4.3 %
3 - Diesel-engined heavy duty vehicles	4.1 %
4 - Catalysed diesel-engined passenger cars	3.8 %
5 - Non-catalysed diesel-engined passenger cars	3.6 %
6 - Construction	2.4 %
7 - Non-catalysed diesel-engined light duty vehicles	2.3 %
8 - Catalysed diesel-engined light duty vehicles	2.2 %
9 - Non-metallic mineral, construction materials	1.9 %
10 - Tertiary, commercial and institutional	1.7 %
11 - Iron and steel industry	1.5 %
12 - Paper, cardboard	1.5 %
13 - Inland navigation	1.5 %

Comments

In 2006, PM_{1,0} emissions in mainland France accounted for 190 kt, a decrease of 44% between 1990 and 2006 (-152 kt). The emissions in the year 1991 were exceptionally high (maximum observed during the period) mainly due to a high consumption of wood in the residential/tertiary sector.

The major source was residential/tertiary with 66% of total emissions in mainland France in 2006, especially from fuel combustion (coal, wood and fuel oil).

Road transport came in second place with 16% due to diesel combustion.

On the whole, emissions had a decrease tendency since 1990 in every sectors but other transports than road. This diminution is partly due to improvements in techniques to limit dust in iron and steel industry, and for biomass combustion.

PM_{1,0}

EMISSIONS DANS L'AIR EN FRANCE METROPOLITAINE (unité Gg = kt)

Source CITEPA / CORALIE / format SECTEN

mise à jour : 28 février 2008

Secten_niv_1_PM-d/PM1.xls

Année	Transfor- mation énergie	Industrie manufac- turière	Rési- dentiel / tertiaire	Agricul- ture/syl- viculture hors UTCF (**)	Transport routier	Autres transports (*)	UTCF (**)	TOTAL	Hors total (*)
1990	33	28	218	13	45	3,7	0	342	12,7
1991	32	28	265	13	51	3,6	0	392	13,1
1995	22	21	216	12	58	3,9	0	333	11,6
2000	12	18	176	11	47	3,7	0	267	15,4
2001	9	16	163	11	46	4,1	0	248	13,3
2002	7	17	143	11	42	4,3	0	225	13,0
2003	8	17	149	10	40	4,5	0	228	14,0
2004	4	19	143	10	38	4,4	0	219	16,0
2005	4	18	135	9	33	4,5	0	203	14,8
2006	4	18	125	9	31	4,5	0	190	15,5
2007 (e)	4	18	118	9	30	4,5	0	182	16,0

(*) selon définitions de la CEE-NU - les émissions répertoriées hors total ne sont pas incluses, à savoir les émissions maritimes et aériennes internationales, ainsi que les émissions des sources biotiques des forêts et les émissions des sources non-anthropiques.

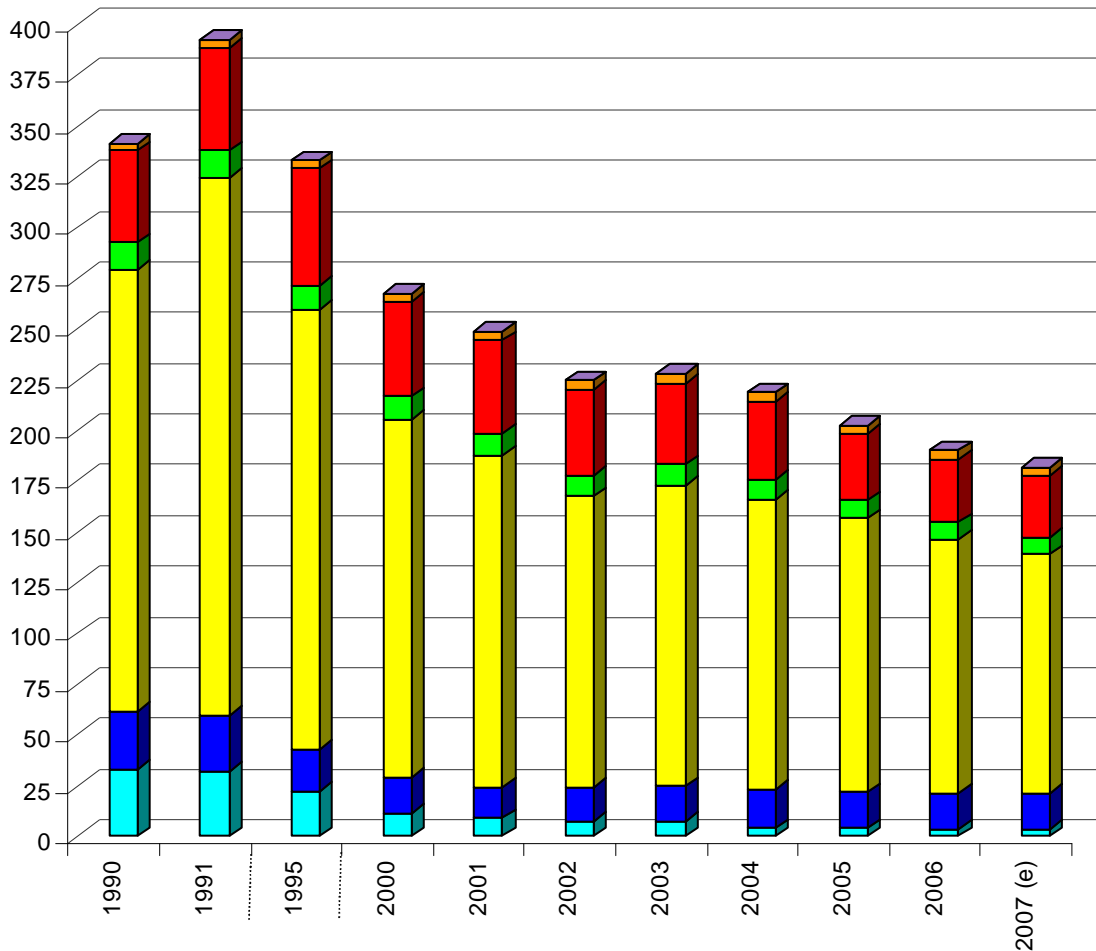
(**) Utilisation des Terres, leur Changement et la Forêt

(e) estimation préliminaire

Avertissement : ces valeurs sont régulièrement révisées et complétées afin de tenir compte de l'amélioration permanente des connaissances, des méthodes d'estimation et des règles de restitution. Les utilisateurs sont invités à s'assurer de l'existence de mises à jour plus récentes.

PM_{1,0}

Emissions atmosphériques par secteur en France métropolitaine en kt



(e) estimation préliminaire

