



## Criterion 6

*MAINTENANCE OF OTHER SOCIOECONOMIC FUNCTIONS AND CONDITIONS*



## Indicator 6.1

Number of forest holdings, classified by ownership categories and size classes

### ■ Public forests managed by the Office national des forêts (ONF)

#### Number of forest holdings and area of public forests by size class

Area class	State-owned forests			Allocated state-owned lands			Other forests governed by forest regulations			Total			
	Nb	Area (ha)	% (Area)	Nb	Area (ha)	% (Area)	Nb	Area (ha)	% (Area)	Nb	Area (ha)	% (Area)	Aver. Area
0-1 ha	1	1	0.0	0	0	0.0	61	43	0.0	62	44	0.0	0.7
1-4 ha	2	6	0.0	0	0	0.0	474	1 230	0.0	476	1 236	0.0	2.6
4-10 ha	5	30	0.0	1	7	0.0	1 002	7 000	0.2	1 008	7 037	0.2	7.0
10-25 ha	28	510	0.0	6	100	0.1	2 084	35 500	1.2	2 118	36 110	0.8	17.0
25-50 ha	57	2 100	0.1	7	300	0.4	2 212	81 400	2.8	2 276	83 800	1.8	36.8
50-100 ha	74	5 700	0.3	10	700	0.9	2 637	192 100	6.7	2 721	198 500	4.3	73.0
100-500 ha	424	120 200	7.1	23	5 100	6.5	5 507	1 226 500	42.5	5 954	1 351 800	28.9	227.0
500-1,000 ha	257	183 600	10.8	8	5 100	6.5	869	590 700	20.5	1 134	779 400	16.7	687.3
1,000-10,000 ha	465	1 178 200	69.2	12	39 500	50.0	421	741 100	25.7	898	1 958 800	41.9	2 181.3
10,000 ha and over	15	212 100	12.5	1	28 300	35.8	1	12 400	0.4	17	252 800	5.4	14 870.6
<b>Total</b>	<b>1 328</b>	<b>1 702 400</b>	<b>100.0</b>	<b>68</b>	<b>79 000</b>	<b>100.0</b>	<b>15 268</b>	<b>2 887 900</b>	<b>100.0</b>	<b>16 664</b>	<b>4 669 527</b>	<b>100.0</b>	<b>276.6</b>

Source: Office national des forêts (ONF) 2010, managed area repository.

The ONF currently manages nearly 16,700 different forest units, including 15,268 non-state-owned forests, mainly owned by local authorities. The mean unit size varies markedly according to the public forest category, i.e. estimated at 1,282 ha for state-owned forests, but only 189 ha for other forests governed by forest regulations. Thus 92.5% of the state-owned forest area is occupied by units of over 500 ha, while most other public forest area (53.4%) contain units of less than 500 ha. State-owned forests include 15 very large forest ranges of more than 10,000 ha (12.5% of the area) with the largest being the Orléans state-owned forest which is almost 35,000 ha. Small units of less

than 100 ha account for only 7% of the public forest area but represent over half of the units managed by ONF.

State-owned forests in Corsica were transferred to the Collectivité Territoriale de Corse (in compliance with Article 21 of the law of 22 January 2002). This freehold transfer took effect on 1 January 2004. In contrast, the state-owned forest area increased by around 3,000 ha between 2005 and 2010 following a range of different land transactions.

Note: Public forests refer to all wooded and unwooded land governed by forest regulations, i.e. belonging to the State, public authorities and certain public institutions. Unwooded land represents around 15% of state-owned forests and 10% of forests owned by public authorities. The 79,000 ha of rezoned state-owned land concerned is mainly military land. Other forests governed by forest regulations are mainly forests owned by public authorities (communal and sectional), as well as forests belonging to public institutions, public utility institutions, mutual companies and savings banks.

## Regional distribution

### State-owned forests

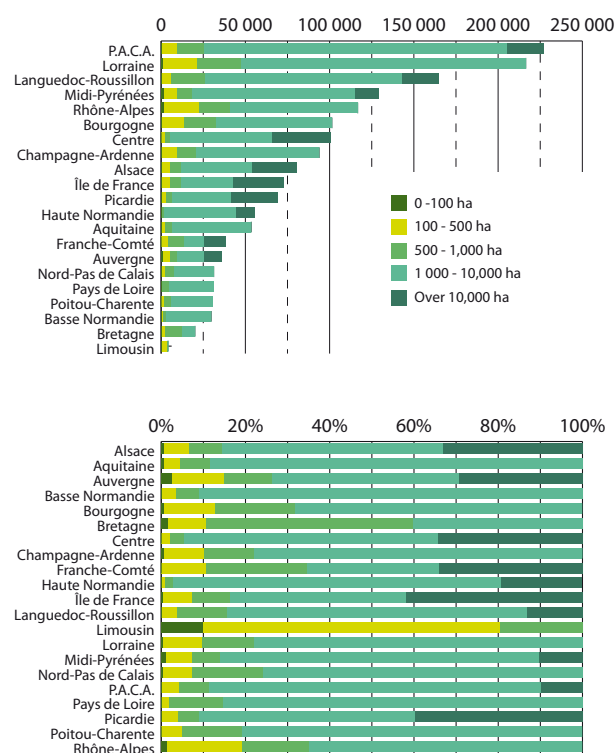


Figure 35: Percentage of the state-owned forest area (excluding rezoned state-owned land) ranked by size class and region, and total area of state-owned forests (excluding rezoned state-owned land) by size class and region.

Source: Office national des forêts (ONF) 2010, managed area repository.

Note: The breakdown by state-owned forest region excludes rezoned state-owned land, which can bias the public forest distribution at some locations (e.g. concerning the Canjuers military station in Var region, the Centre d'Essais des Landes in Aquitaine and La Courtine military station in Limousin).

The largest state-owned forest areas are found in Provence-Alpes-Côte d'Azur (PACA) (227,000 ha), Lorraine (216,000 ha), Languedoc-Roussillon (165,000 ha) and Midi-Pyrénées (129,000 ha). The most extended areas of very large state-owned forests (more than 10,000 ha) are in central France: 34,000 ha in the Centre region, 30,700 ha in Île-de-France and 27,600 ha in Picardie. Conversely, eastern France contains the largest areas of small state-owned forests (less than 1,000 ha): Lorraine has 47,600 ha, Rhône-Alpes 41,000 ha and Bourgogne 32,000 ha.

In terms of relative forest area, large state-owned forests (over 10,000 ha) account for a substantial relative area (over a third of the state-owned forest area) in Île-de-France (42% of the state-owned forest area), Picardie (40%), Centre (35%), Franche-Comté (34%) and Alsace (33%). The smallest state-owned forests (under 1,000 ha) account for a substantial relative area (over a third of the state-owned forest area) in Limousin (100% of the state-owned forest area, but the overall area concerned is very small), Bretagne (60%), Franche-Comté (35%) and Rhône-Alpes (35%).

The highest total areas of other forests governed by forest regulations are in PACA (423,000 ha), Lorraine (360,000 ha), Franche-Comté (360,000 ha) and Rhône-Alpes (350,000 ha). Regions with the greatest area of large forests owned by

### Others forests governed by forestry regulations

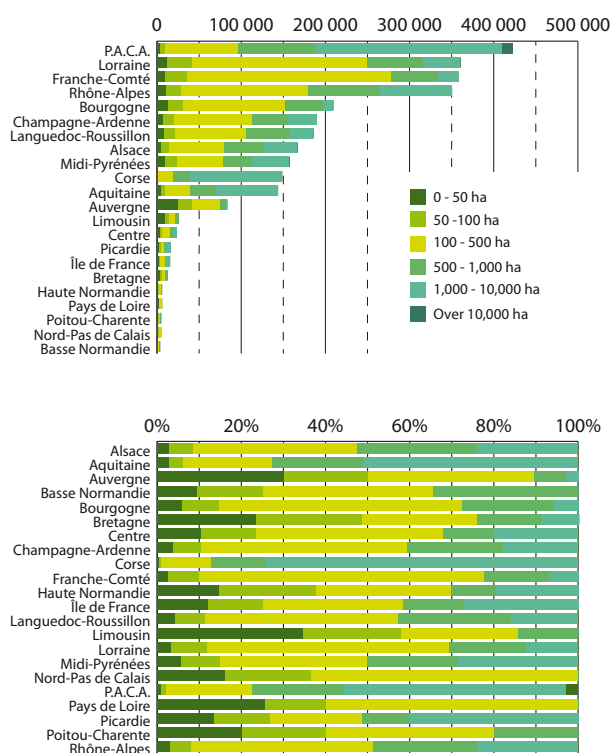


Figure 36: Percentage of other forests governed by forestry regulations ranked by size class and region, and total area by size class and region.

public authorities (over 1,000 ha) are PACA (235,000 ha), Corsica (110,000 ha)—where state-owned forests were transferred to the Collectivité Territoriale de Corse—and Rhône-Alpes (84,000 ha). In contrast, regions with the highest area of small forests owned by public authorities (under 100 ha) are Lorraine (42,000 ha), Auvergne (41,000 ha) and Franche-Comté (36,000 ha).

Large forests owned by public authorities (over 1,000 ha) represent a high relative forest area in Corsica (74% of the forests owned by public authorities), PACA (56%), Aquitaine (51%) and Picardie (40%). The smallest forests owned by public authorities (under 100 ha) account for a high relative area in Limousin (58% of the area of forests owned by public authorities), Auvergne (50%), Bretagne (48%), Pays-de-la-Loire (40%) and Poitou-Charentes (40%).

## ■ Private forests Number of properties and private forest area by size class

Size class	1976-83				1999				2002				
	Number of owners		Area		Number of owners		Area		Number of owners		Area		
	total (x 1,000)	%	total (x 1,000 ha)	%	total (x 1,000)	%	total (x 1,000 ha)	%	total (x 1,000)	%	total (x 1,000 ha)	%	av. (ha)
0-1 ha	2 360	64.2	773	7.9	2 361	67.8	745	7.0	2 111	65.8	667	7.1	0.3
1-4 ha	1 165	31.7	3 188	32.7	934	26.8	2 975	28.0	724	22.5	1 454	15.5	2.0
4-10 ha	100	2.7	1 464	15.0	120	3.4	1 761	16.6	229	7.1	1 414	15.1	6.2
10-25 ha	42	1.1	1 905	19.6	58	1.7	2 641	24.9	95	3.0	1 448	15.4	15.2
25-50 ha	9	0.2	2 410	24.7	11	0.3	2 498	23.5	28	0.9	977	10.4	34.5
50-100 ha									13	0.4	890	9.5	69.1
100-500 ha									8	0.3	1 580	16.8	187.5
500-1,000 ha									1	0.0	387	4.1	670.1
1,000-10,000 ha									0	0.0	499	5.3	2 089.3
10,000 ha and over									0	0.0	67	0.7	13 357.3
<b>Total</b>	<b>3 676</b>	<b>100.0</b>	<b>9 740</b>	<b>100.0</b>	<b>3 484</b>	<b>100.0</b>	<b>10 620</b>	<b>100.0</b>	<b>3 210</b>	<b>100.0</b>	<b>9 385</b>	<b>100.0</b>	<b>2.9</b>

Sources:

- 1976-83: survey on economic structures in silviculture conducted by the Service central des enquêtes et études statistiques (SCEES), now the Service de la statistique et de la prospective (SSP);
- 1999: survey on the structure of private forest properties conducted by SCEES (now SSP) for properties of 1 ha and over, and based on the land register for properties of less than 1 ha.
- 2002: land register.

Note: caution is required when making comparisons of any of the data presented here, since:

- data for the 0-1 ha class between 1976-83 and 1999 cannot be compared since the 1976-83 survey was focused on woodland areas of over 0.5 ha and based on the Enquête annuelle sur l'utilisation du territoire (Teruti), whereas the 1999 data were derived from the land register due to the lack of available elements in the 1999 survey of SCEES (now SSP).
- the SCEES 1976-83 survey was based on the sampling points from the Teruti survey in which the landowners were identified, thus explaining why the total area was underestimated (9.7 Mha out of 10.4 Mha recorded).
- finally, the 2002 data were from the land register since no new surveys had been carried out on the private property structure, thus explaining why the area was underestimated (as a guide, the 1999 SCEES survey estimated the area of private properties of over 1 ha at 9.9 Mha, as compared to 8.3 Mha estimated via the land register at the same date). The land register actually overestimates land that is not very taxed (fallow and heathland) to the detriment of more taxed land (utilised farmland, grasslands and forests). It is biased by under-reporting and by the slowness of the updating process (Koeber et al., 2000).

More than half of the private forest area consists of units of less than 25 ha. The mean size of private forest properties is now estimated at nearly 3 ha, whereas it was 2.6 ha 20 years ago. The number of private owners is still very high (3.2 million according to the land register in 2002), which puts France in pole position amongst European countries. Very small forest units of less than 1 ha are owned by 2.1 million private owners, or two-thirds of all private owners in France.

A survey conducted by SCEES (now SSP) in 1999 on forest properties of over 1 ha revealed the legal status of private forest owners. Individual forest owners are the most numerous, i.e. 96% of the total for around 83% of the area. They are represented by individuals, communal matrimonial estates, joint- and co-owners. There are not many legal entities (4%) but they account for more than 17% of the area. Their units are quite large, i.e. 43 ha on average. These include forest management groups that own the largest units (mean 110 ha).

These figures reflect the high level of private land parcelling in France, which is a major economic handicap that is hampering operational competitiveness while locally promoting 'non-management'. Very small properties are underlogged, while also being enclaves that may hamper logging on neighbouring properties (Puech, 2009). Land

restructuring, grouping of land owners and providing expert management advice to land owners could help offset this land parcelling problem. The French forest law of 9 July 2001 created a fiscal incentive (in the form of a tax reduction) to encourage investment in forests (DEFI), to:

- combat the problem of forest land parcelling: concerning the acquisition of land (woodland, forests, cleared land to be planted) and subscription for shares of forest management groups or Sociétés d'épargne forestière (SEF);
- stimulate forestry work: concerning forestry work undertaken by the owner, a forestry group or an SEF for which taxpayers are shareholders;
- develop forest management and promote economic organization of the sector: concerning compensation for carrying out a contract for woodland and forest management with a forest expert, a forest cooperative, a producers' organization or with ONF.

### Box 7: Forest cooperation

French forestry cooperation is a young movement in comparison to that of other European countries. It began gaining momentum in the 1980s (UCFF, 2004). The cooperatives are involved to an increasing extent in logging, logistics and marketing activities, as well as in the development of services concerning forest management and forestry project management. The following table presents statistical data on cooperative group members of the Union de la coopération forestière française (UCFF). A review of 23 cooperatives on the basis of 1999 data showed that 70% of UCFF members owned at least 10 ha (source: UCFF).

	2009
Number of cooperatives and members' groups	27
Number of member producers	99 843
Number of member producers with PEFC certification	28 350
Concerned area	1 965 000 ha
Number of salaried staff	907
Volume marketed/year	5 971 000 m <sup>3</sup>

Source: Union de la coopération forestière française (UCFF), statistical data on 31/12/2009.

Regional distribution of the different property sizes

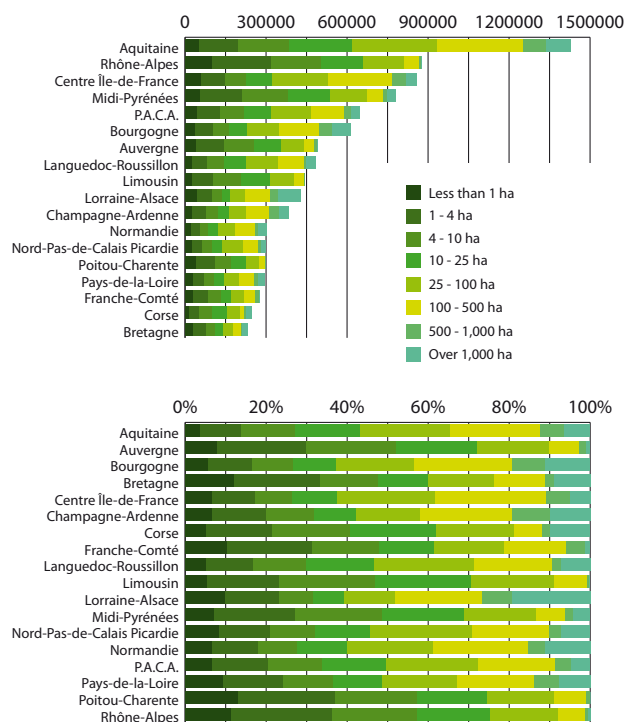


Figure 37: Percentage of private forest area ranked by size class and region, and total private forest area by size class and region.

Source: Land register 2002.

With 1.4 Mha of private forests, Aquitaine is by far the region in which private forests are most represented, followed by Rhône-Alpes (0.9 Mha), Centre-Île-de-France (0.9 Mha) and Midi-Pyrénées (0.8 Mha).

In Poitou-Charentes, Bretagne, Rhône-Alpes and Franche-Comté, over 10% of the private forest area contains properties of at least 1 ha (10-13%). Conversely, the lowest rate of private wooded area covered by these small properties is in Aquitaine (3%).

Rhône-Alpes, Auvergne and Limousin regions have the highest rates of private wooded area covered by 1-25 ha properties (62-65%), contrary to Lorraine-Alsace, Centre-Île-de-France and Bourgogne regions (29-32%).

The highest rates of private wooded area covered by 25-100 ha properties are found in Centre-Île-de-France, Languedoc-Roussillon and Nord-Pas-de-Calais Picardie (24-25%).

There are high regional differences with respect to properties of over 100 ha. They represent more than 40% of the private wooded area in Lorraine-Alsace, Bourgogne and Champagne-Ardenne (42-48%). In contrast, they account for less than 10% of this area in Rhône-Alpes, Poitou-Charentes and Limousin.

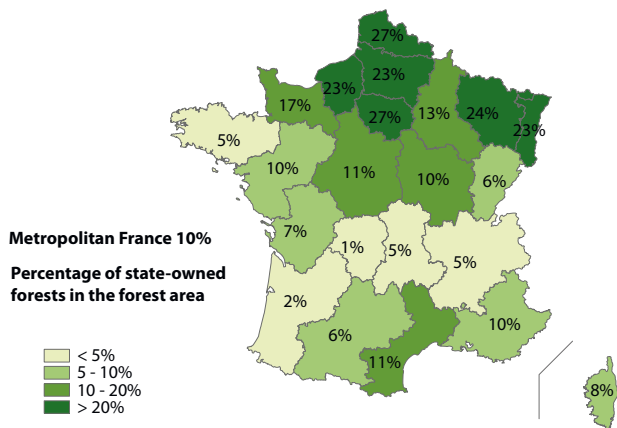
All properties

Forest available for wood supply area (including poplar plantations) by property category.

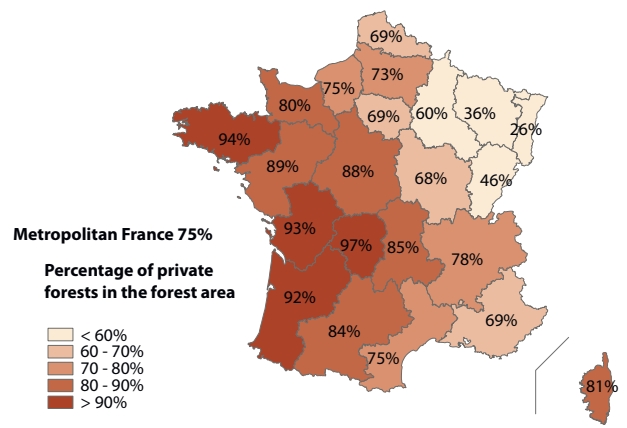
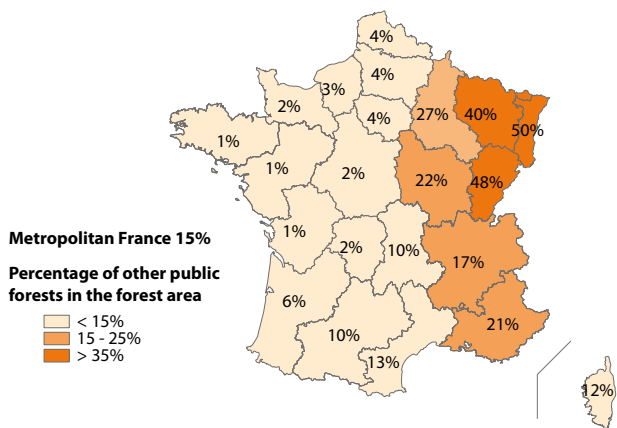
Property category	FAWS area	%	Total area
	1 000 ha		1 000 ha
State-owned	1 450 ± 33	9.5	1 797 ± 28
Other public land	2 360 ± 35	15.4	2 741 ± 24
Private	11 510 ± 99	75.1	50 405 ± 23
<b>All property categories</b>	<b>15 319 ± 104</b>	<b>100.0</b>	<b>54 944</b>

Source: French National Forest Inventory (NFI), survey years 2006 to 2009.

Note: the data presented here are from NFI, which inventories metropolitan French forests regardless of the property status. The forest definition used here is in line with that given by the Food and Agriculture Organization of the United Nations (FAO). These figures only concern FAWS (cf. definitions in Appendix III). NFI assigns a legal property category to each sampling point on the basis of information provided by ONF. The cartographic layer used for this breakdown by property is from before 2004, the year when state-owned forests in Corsica were transferred to the Collectivité Territoriale de Corse (art. 21 of the law of 22 January 2002). Consequently, in the 'all property' category on the table, Corsican state-owned forests are still attached to state-owned forests.



Private forests represent three-quarters of the FAWS area (11.5 Mha), state-owned forests around 10% (1.4 Mha) and other public forests 15% (2.4 Mha). However, these percentages vary substantially between regions. Public forests are mainly found in northeastern France (Lorraine, Alsace, Franche-Comté).



Map 25: Percentage of state-owned forests, other public and private forests in the FAWS area.

Source: French National Forest Inventory (NFI), survey years 2006 to 2009, forests available for wood supply.



Mixed beech-fir stand in Pyrénées-Atlantiques region.

### Indicator 6.1.1

#### *Integration of forests in local initiatives*

Article 64 of law n° 2010-874 of 27 July 2010 for the modernization of agriculture and fisheries modifies Article L12 of the French forest code concerning the establishment of a local forest development strategy (SLDF) in local areas relevant to the outlined objectives. The SLDF:

- is a locally oriented approach that was established upon the initiative of local stakeholders: local authorities, producers' organizations, the Centre régional de la propriété forestière (CRPF), the Office national des forêts (ONF) or the Chamber of Agriculture;
- involves developing, on the basis of an economic, environmental and social assessment, an operational multi-year action programme geared towards the development of sustainable forest management. This programme gives rise to agreements that could be eligible for public support funding;
- is managed jointly by a committee headed by an elected local authority;
- defines the objectives, indicators concerning actions to be carried out and impact indicators. An annual report on the progress achieved is drawn up and addressed to the Commission régionale de la forêt et des produits forestiers (CRFPF).

The action programme aims to:

- mobilise wood by promoting dynamic and sustainable stewardship;
- ensure that environmental and social demands are fulfilled;
- contribute to employment and rural development;
- promote technical and economic grouping of forest property owners, land restructuring and grouped management on a forest massif scale;
- strengthen the competitiveness of the wood industry.

Territorial forest charters (CFT) and massif development plans (PDM) are the two main territorial management instruments used to implement SLDFs and mentioned in the law of July 2010 for the modernization of agriculture and fisheries. They are described in the memorandum DGPAAT/SDFB/C2010-3079 of 9 August 2010, of the French Ministry of Agriculture, Food, Fisheries, Rural Affairs and Spatial Planning (MAAPRAT).



## Territorial forest charters

### Number of CFTs and areas concerned, all progress stages combined

Number of CFTs	CFT areas (ha)	Number of CFT districts	Forest area (ha)	Percentage forest (%)
118	10 133 812	5 341	4 159 736	41%

Source: Réseau national des Chartes forestières de territoire (CFT), Fédération nationale des communes forestières (FNCoFor)/Institut de Formation Forestière Communale (IFFC), 2011.

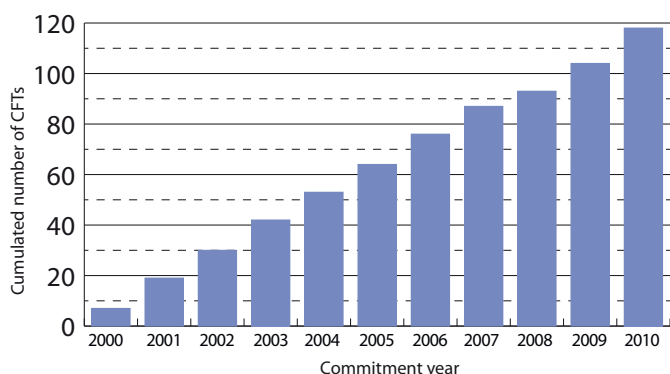


Figure 38: Cumulated number of territorial forest charters (CFT) according to the commitment date.

Source: Réseau national des Chartes forestières de territoire (CFT), Fédération nationale des communes forestières (FNCoFor)/Institut de Formation Forestière Communale (IFFC), 2011.

CFTs were launched via the first article of the French forest law of 9 July 2001 and are now attached to SLDFs via the French agriculture and fisheries modernization law of 27 July 2010.

CFTs are instruments for sustainable management and development of rural areas. The aim is to further the development of forests in their economic, social and environmental setting, thus promoting the multifunctional role of forests on a local level. It also aims to fulfil specific local expectations (economic, ecological, social and cultural), while taking the objectives and constraints of public and private forest owners into account.

CFTs are the result of local initiatives, whether they be communal or intercommunal. They are based on a collaborative approach between different local stakeholders focusing the development of shared collective projects. The approach fosters encounters between stakeholders offering goods and services, i.e. public or private foresters, and requestors (local authorities, various economic operators, public establishments, forest users' or environmental protection associations, the State) requiring these goods and services.

CFT monitoring and networking were initiated by FNCoFor. There were 118 CFTs in early 2011 (all stages combined) for an area of 10.1 Mha, or 18% of the area of metropolitan

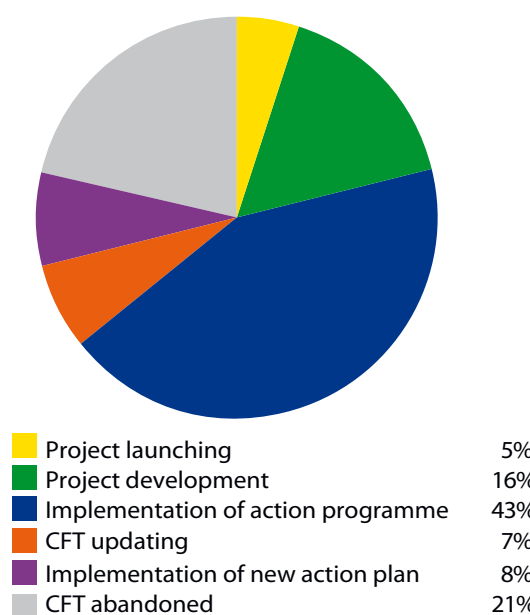


Figure 39: Distribution of the cumulated number of territorial forest charters (CFT) in 2011 according to the progress stage.

Source: Réseau national des Chartes forestières de territoire (CFT), Fédération nationale des communes forestières (FNCoFor)/Institut de Formation Forestière Communale (IFFC), 2011.

France. CFTs are distributed throughout France. However, there is a higher concentration in the southeast along a diagonal line between Ardennes and Gironde regions, an accurate reflection of the extent of forests in the different regions (FNCoFor/IFFC, 2009). The mean CFT afforestation rate is 41%. The CFT forest area is 4.16 Mha, with 66% private forests, 17% forests owned by public authorities and 12% state-owned forests. The 118 CFTs are at different progress stages (cf. diagram): 58% in the operational phase (implementation or updating of the multi-year action programme), 21% in the starting and design phase (launching of the approach, project development, validation) and 21% abandoned (the CFT action programme was not carried out or not renewed).

## ■ Massif development plans

### Number of massif development plans (PDM) and their areas

Cumulated number of PDM	Total PDM area (ha)	Public forest area (ha)	Private forest area (ha)	Total forest area (ha)	Percentage forest (%)
307	6 852 000	735 000	1 826 000	2 561 000	37%

Source: CEMAGREF, situation on 01/01/2011.

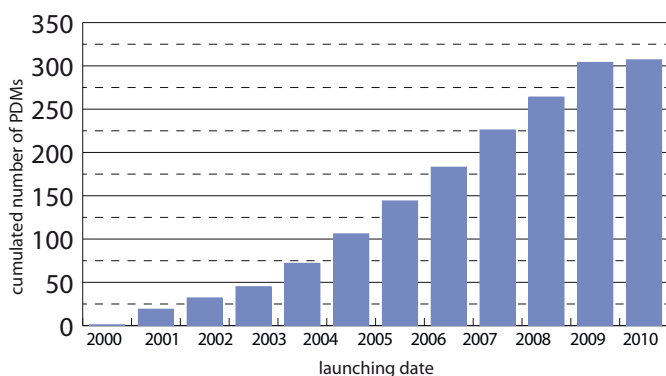


Figure 40: Cumulated number of massif development plans (PDM) according to the launching date.

Source: CEMAGREF, situation on 01/01/2011.

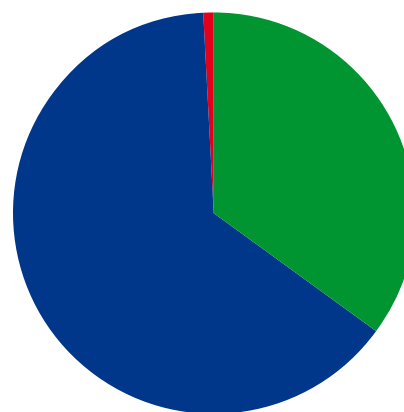


Figure 41: Distribution of the cumulated number of massif development plans (PDM) in 2011 according to the progress stage.

Source: CEMAGREF, situation on 01/01/2011.

Private forest institutions have been setting up PDMs since 2000. These plans are mainly group development project instruments that enhance the organization of the silviculture sector, while improving supplies to primary wood manufacturing industries.

These territorial development instruments promote the development of new production activities and services (development of non-wood products and ecological and services, conservation of certain exceptional ecological environments, water protection) and contribute to supporting rural employment.

The PDM approach involves assessment and discussions with owners and other local stakeholders so as to carry out operations tailored to the specific features of each massif and consistent actions in different properties. A PDM includes:

- An assessment of the massif: social, economic and environmental analysis of the massif and drawing up of a report that includes guidelines for management of the massif, and management proposals.

- Action and coordination proposals:
  - a collective approach to the massif: coordination phase with silviculturists, development of forest area management projects;
  - an individual approach: individual assessments, development of work programmes, silviculturists' choices of self or group management.
- PDM implementation:
  - formalization of projects planned in individual management documents (simple management plans) or collective sustainable management documents so as to promote long-term actions and ensure their follow-up;
  - on the basis of individual commitments of silviculturists, coordinating work to be carried out by different stakeholders on the massif (cooperatives, forest experts, forestry work contractors, etc.).

## Indicator 6.1.2

### Information and training of forest owners and managers on sustainable forest management

#### ■ Number of trained public forest managers

	2009	2010
Number of training days benefitting ONF staff on the topic 'Consolidate sustainable management of public forests'	12 000	11 000

Source: Office national des forêts (ONF).

Note: ONF staff spend a considerable amount of their time informing owners (forests owned by public authorities)—meetings, dissemination of informative documents, field meetings—but this time is hard to quantify.

ONF training is organized along the three main lines of the ONF establishment project:

- line 1: consolidating sustainable public forest management (25% of the training package);
- line 2: creating added value in wood, work and service activities (35%);
- line 3: promoting human relations and enhancing the efficiency of the organization (40%).

The 'consolidating sustainable public forest management' line includes many training courses on various aspects of sustainable forest management (recognition and management of forest habitats, fauna, flora, tailoring management to climate change, hunting management, etc.). In 2009, ONF staff benefitted from 12,000 training days on this line. The slight decrease noted in 2010 was mainly due to a cyclical increase in lines 2 and 3 (implementation of large computer projects) and the renewal of statutory training.

#### ■ Training forest-owning communities

Elected representatives make the most important decisions concerning community-owned forests, e.g. decisions to sell or not sell, selling options, withdrawal price setting, adoption of required work programs. They participate in drawing up management programmes that must comply with guidelines set by elected representatives with respect to the role that they assign to forests. They institute policies concerning the development of forest areas.

The extent of responsibilities of municipal representatives with respect to sustainable management of their forests highlights the need to train mayors, elected representatives and community staff so as to enable elected representatives to make the most suitable decisions in terms of the development, conservation and enhancement of community forest heritage.

IFFC—an association under 'Law 1901'—was founded in July 1990. IFFC serves as a specialised instrument for FNCoFor in the fields of training and forest development. It edits regularly updated educational documents that are disseminated to all forest-owning communities and ONF foresters. It also offers:

- national training courses on topics requested by mayors;
- educational and financial training assistance organized by departmental associations and regional unions;
- educational trips, meetings, conferences on topical issues concerning community-owned forests and on topics to meet future needs.

The training courses are focused especially on the following topics: mobilization and marketing of wood, forest management, hunting, forestry work, fuelwood, timber and estovers.

Year	Number of training days provided by IFFC and regional forest community unions	Number of trainees
2007	129 (75 days on community-owned forests, 45 topic training courses and 9 educational trips)	3 700 (2,627 elected representatives and 1,035 ONF staff members and others)
2008	101	3 002
2009	135	2 976
2010	150	2 851

Source: Fédération nationale des communes forestières (FNCoFor)/ Institut de Formation Forestière Communale (IFFC).

## ■ Private forests: number of trained and informed silviculturists and managers

### Summary of trained and informed silviculturists and managers

Items	2007	2009	Notes
	Nb	Nb	
Informed silviculturists and managers (Details in table below)	419 915	468 978	Increase in connections to regional delegation websites (Centres régionaux de la propriété forestière - CRPF) of CNPF.
Trained silviculturists and managers (Details in table below)	25 074	22 133	Decrease in the number of extension meetings organized by regional delegations (CRPF) of CNPF.
<b>Total before reduction</b>	<b>444 989</b>	<b>491 111</b>	
10% reduction for duplicates	- 44 499	- 49 111	Correction of overestimations associated with duplicate counts for 'informed' and 'trained'.
<b>Overall total 'Informed + Trained'</b>	<b>400 490</b>	<b>442 000</b>	
Rate of informed and trained silviculturists and managers	36%	40%	Calculated on the basis of 1,100,000 forest owners, considered unchanged between 2007 and 2010.

Source: Centre national de la propriété forestière (CNPF).

### Informed silviculturists and managers

Items	2007	2009	Notes
	Nb	Nb	
Recipients of regional information magazines* and newsletters published by CNPF	216 665	165 825	Increase in the area threshold for the dissemination of magazines in certain regions (e.g. from 4 to 10 ha).
Sale of CNPF-Institut pour le développement forestier (IDF)* documents	4 431	5 000	High demand for <i>Flore forestière méditerranéenne</i> , following its publication in 2008.
Connections to CNPF-managed websites and intranet sites*	238 673	343 427	Increase in connections to existing sites and set up of new sites in several regions.
Individual technical support (technical visits by CNPF agents at the request of silviculturists)	6 803	6 834	Stability.
<b>Total before reduction</b>	<b>466 572</b>	<b>521 086</b>	
10% reduction for duplicates	- 46 657	- 52 108	Correction of overestimations associated with duplicate counts for all items.
<b>Total 'informed'</b>	<b>419 915</b>	<b>468 978</b>	

\*a specific allowance is applied so as to only account for silviculturists and managers.

Source: Centre national de la propriété forestière (CNPF).

The French forest code law (Article L.221.1) assigned the Centre national de la propriété forestière (CNPF) with the mission of developing, orienting and improving the sustainable management of woodlands and forests of private owners. CNPF thus carries out forest development activities focused especially on informing and training silviculturists and forest managers.

The rate of informed and trained private silviculturists increased from 36 to 40% between 2007 and 2009.

The websites explain this positive trend. These sites, along with regional magazines, are by far the most important information outlets. They enable the dissemination of general fundamental information that all forest owners require.

Website visits are increasing steadily from year to year. Almost all regions now have a dedicated website, developed and managed by CNPF.

In certain regions, the increase in the area threshold

considered for dissemination of newsletters to owners explains the decline in the number of recipients. These newsletters are nevertheless still essential for boosting awareness. They are the only source of forest information for many silviculturists. Several regional surveys (Centre, Normandie, Poitou-Charentes, etc.) indicate that the newsletters are read, appreciated and used as reference documents.

There is also an increase in purchases of books from the Institut pour le développement forestier (IDF) by silviculturists, especially due to the popularity of the handbook *Flore forestière méditerranéenne* following its publication in 2008.

## Trained silviculturists and managers

Items	2007	2009	Notes
	Nb	Nb	
Participants in extension meetings coordinated by CNPF*	26 168	22 395	Tightening of meetings on priorities outlined in regional policies (sustainable forest management certification, etc.).
Participants in IDF training courses of CNPF*	437	657	Development of customized training courses, as a complement to those proposed in the standard catalogue.
Participants in courses of the Association de formation à la gestion forestière (FOGEFOR) coordinated by CNPF	1 255	1 540	Progression of training to enhance knowledge and perfect skills.
<b>Total before reduction</b>	<b>27 860</b>	<b>24 592</b>	
10% reduction for duplicates	- 2 786	- 2 459	Correction of overestimations associated with duplicate counts for all items.
<b>Total 'trained'</b>	<b>25 074</b>	<b>22 133</b>	

\* a specific allowance is applied so as to only account for silviculturists and managers.

Source: Centre national de la propriété forestière (CNPF).

Note: This indicator, which was established by CNPF in 2007, accounts for information and training initiatives of this establishment to the benefit of silviculturists and forest managers.

The number of technical visits (4<sup>th</sup> row on the above table) by regional delegations (Centre régionaux de la propriété forestière - CRPF) of CNPF has remained steady. They concern all regions and mainly target 'new' owners individually wishing to get informed with the help of a technician. An increasing number of requests concern stand health assessments and information pertaining to sustainable forest management documents.

The 'training' component is more contrasted. The indicator 'participants on extension meetings' is decreasing due to the decline in the number of extension meetings organized by CRPF. These meetings represent a first step in the training of forest owners, enabling them to discover and become familiar with forest management practices. They offer targeted and detailed contributions on all aspects of sustainable silviculture management (economics, techniques, regulations, taxation, etc.). The most efficient concern small sectors (townships or even smaller) with a reasonable number of participants (30-40 maximum), thus making it possible to alternate theoretical presentations with practical demonstrations. The drawback is that the meeting preparation and coordination are time consuming (minimum 3-4 days per meeting). In several regions the trend is towards a decrease in these meetings due to a lack of resources.

Training courses of the Association de formation à la gestion forestière (FOGEFOR) and those organized by IDF work well, even though in 2010 there was a sharp decline in these courses likely due to a lag effect of the economic crisis. These different training courses serve as educational support for silviculturists concerning implementation of forest management strategies and mastering top-notch methods and techniques (drawing up simple management plans, mastering the cartography of forest sites, using forest classifications to describe stands, etc.). FOGEFOR training courses designed for 'advanced' silviculturists (skill development, professionalization, reference groups) are a follow up to basic courses for beginners, for which new participants are scarce.

### Indicator 6.1.3

#### Sustainable forest management certification

Certification aims to provide an objective impartial proof of the implementation of sustainable forest management practices. The quality of forest management practices can be assessed on the basis of:

- the forest area certified by PEFC (Programme for the Endorsement of Forest Certification schemes) or FSC (Forest Stewardship Council) with respect to sustainable forest management;
- the number of logging companies with PEFC or FSC certification.

These data enable estimation of the forest area and the minimum number of companies concerned by sustainable forest management. Other areas and companies may also comply with sustainable management criteria, but it is impossible to measure this.

### ■ Program for the Endorsement of Forest Certification Schemes (PEFC)

#### Area and number of owners and companies with PEFC certification (in December of the concerned year)

	2005	2006	2007	2008	2009	2010
PEFC-certified area (ha)	4 067 688	4 401 200	4 577 105	5 066 619	5 089 378	5 151 484
Number of PEFC-certified owners	16 452	20 440	23 214	43 202	47 196	48 175
Number of PEFC-certified loggers	290	306	301	317	310	319
Number of PEFC-certified sawyers and loggers-sawyers	365	440	485	511	530	563

Source: Programme for the Endorsement of Forest Certification schemes (PEFC).

Note: The PEFC statistics group sawyers and loggers-sawyers. It is therefore not possible to exclude sawyers whose activity is not directly associated with forests. However, most sawyers are also loggers.

PEFC certification is a guarantee of compliance with the sustainable forest management criteria defined in the Ministerial Conferences on the Protection of Forests in Europe held in Helsinki and Lisbon. Foresters, through their commitment to comply with these criteria, demonstrate their management of the economic, social and environmental impact of their activity. PEFC certification, which is voluntary, thus encourages forest owners to enhance their training on sustainable management practices. Foresters are regularly subject to unannounced checks and visits from a representative of an accredited certification body as part of annual audits of regional entities and monitoring of their members. PEFC certification was designed especially according to the specific features that prevail in Europe, which are quite marked in France, especially with respect to the predominance of private forests, which are often highly fragmented, alongside state-owned and community-owned forests. The PEFC system, which is based on the continuous improvement principle, sets objectives that are revised on a 5-year basis. The PEFC-France association pools three categories of stakeholders in the sector (producers, manufacturers and forest users). The distinct regional features are a major focus of the PEFC benchmarks. PEFC-France is thus represented throughout

France by around 15 regional (or interregional) associations responsible for managing forest certification on a local scale. They are responsible for setting forest management rules in line with the constraints of all forest owners and managers within the same region based on assessments.

The area and number of certified owners have been steadily increasing since 2005. Currently, 5.2 Mha of forests have PEFC certification for 48,175 members. The marked increase in the number of certified owners between 2007 and 2008 could be explained by the introduction, by forest cooperatives, of the ‘porting’ concept. Through their PEFC sustainable management certification, they guarantee interventions in members’ properties in compliance with PEFC sustainable forest management principles. They offer members the possibility of ‘porting’, in their name, the PEFC certification of their forests assigned to the cooperative. The owner’s commitment is individual and voluntary. This certification ‘porting’ is tailored to the fragmentation of French private forests and simplifies the commitment of silviculturists in the sustainable management of their forests.

A 5-year PEFC membership of a forest logger is a commitment to comply with the national logging specifications. The aim of the specification document is to promote harmonization and improve the clarity of PEFC requirements applied to logging in France. This document was drawn up by an ad-hoc working group, mandated by PEFC-France, in collaboration with concerned stakeholders. All specifications available when the document was drawn up were taken into account. It includes national requirements supplemented by local requirements applicable in certain regions, while being focused especially on the removal of nutrients from forest ecosystems.

Potential modifications to the national logging specifications must be applied by loggers as soon as possible and at the latest within 12 months following their notification. Loggers, as specified in the membership documents, accept to be monitored internally by the regional PEFC body and externally by the certification institution.

Like the trend with forest owners, the number of PEFC-certified forest companies has been increasing since 2005, and currently 319 forest loggers and 563 sawyers have PEFC certification.

## ■ Forest Stewardship Council (FSC)

### Area, number of forest owners and groups and number of FSC-certified loggers (February 2011)

2011	
FSC-certified area (ha)	15 847
Number of FSC-certified forest owners and groups	17
Number of FSC-certified loggers (chain of control)	10

Source: Forest Stewardship Council (FSC).

Note: FSC statistics concerning the number of loggers pool all companies having logging activities, including sawyers and pulp and paper manufacturers.

FSC is an international not-for-profit NGO. It was established in 1993 to promote responsible forest management worldwide. By responsible management, FSC means management that takes preservation of the natural environment into account, while being socially beneficial and economically viable. The association, which consists of an environmental bureau, a social bureau and an economic bureau, has participatively developed a set of 10 principles and criteria (FSC, 2000). Each FSC-certified forest is audited by an independent certification organization, which checks compliance with the principles and criteria. An initial audit is carried out, followed by yearly audits. A certificate renewal audit is carried out in each certified forest on a 5-year basis. The FSC system, which is tailored for both tropical and temperate forests, has developed instruments to facilitate proper application of the system in fragmented private forests in Europe. There are currently 15,847 ha of certified forests in France, for 17 forest owners and groups. In addition, 10 companies with logging activities are certified.

## Indicator 6.2

Contribution of forestry and manufacturing of wood and paper products to gross domestic product

### Value added per sector and contribution of forestry and wood and paper products to added value and gross domestic product (GDP) (in billion € 2008)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Silviculture and logging	4.3	3.5	4.5	4.0	2.8	3.1	3.1	3.8	4.4	3.4
Woodworking and wood product manufacturing	4.1	4.2	4.0	4.0	4.3	3.7	3.4	3.4	3.7	3.7
Paper pulp, paper and cardboard manufacturing	2.2	2.5	2.8	2.5	2.2	2.0	1.8	1.6	1.5	1.2
Paper and cardboard product manufacturing	3.7	3.7	4.0	3.8	3.7	3.7	3.4	3.1	3.3	3.3
Furniture making (wood and non-wood)	5.0	5.0	5.2	5.0	4.9	4.7	4.5	4.3	4.0	3.6
<b>Total added value</b>	<b>19.3</b>	<b>18.9</b>	<b>20.4</b>	<b>19.4</b>	<b>17.8</b>	<b>17.1</b>	<b>16.2</b>	<b>16.2</b>	<b>17.0</b>	<b>15.2</b>
Total added value France	1447.0	1505.5	1542.7	1568.1	1582.6	1609.4	1640.6	1683.8	1746.0	1750.5
Total added value France excluding service industry	377.7	387.5	390.1	384.3	375.3	376.0	376.8	379.6	396.7	390.8
% added value France	1.3%	1.3%	1.3%	1.2%	1.1%	1.1%	1.0%	1.0%	1.0%	0.9%
% added value France excluding service industry	5.1%	4.9%	5.2%	5.0%	4.7%	4.5%	4.3%	4.3%	4.3%	3.9%
Gross domestic product (production approach)	1622.5	1681.2	1717.7	1743.7	1759.1	1793.0	1829.6	1884.1	1948.4	1948.5
Gross domestic product (production approach) excluding service industries	753.8	777.8	794.8	790.5	788.1	800.2	802.8	823.2	850.5	836.6
% Gross domestic product (production approach)	1.2%	1.1%	1.2%	1.1%	1.0%	1.0%	0.9%	0.9%	0.9%	0.8%
% Gross domestic product (production approach) excluding service industries	2.6%	2.4%	2.6%	2.5%	2.3%	2.1%	2.0%	2.0%	2.0%	1.8%

Source: Institut national de la statistique et des études économiques (INSEE), Comptes Nationaux –2000 basis, according to the Nomenclature économique de synthèse (NES).

Note: Added value is the total production value. It is equal to the production value minus the intermediary consumption. The gross domestic product (GDP) is the aggregate representing the final result of the production activity of resident production units. It can be defined as the sum of gross added values of different institutional sectors or different branches of activity, plus taxes but minus subsidies on the products (which are not allocated to sectors and activity branches).

The data used are from the INSEE Comptes Nationaux (2000 basis), contrary to the ISFM 2005 edition. This source has the advantage of being uniform and continuous over time. However, it does not enable a detailed breakdown by activity. The nomenclature used is from the Nomenclature économique de synthèse (NES) adopted by INSEE in 1994. This nomenclature is associated with the Nomenclature d'activités française (NAF) rev. 1. The activities included in each sector are as follows:

- 'silviculture and logging' (A02 in NES): silviculture, logging, associated services;
- 'woodworking and wood product manufacturing' (F31 in NES): wood sawing and planing; wood impregnation; wood panel manufacturing; framework and joinery manufacturing; wood package manufacturing; manufacturing of various wooden items; manufacturing of cork items, basketry or wicker work;
- 'paper and cardboard product manufacturing' (F33 in NES): corrugated cardboard industry; manufacturing of cartons, paper wrappings, paper articles for sanitary or domestic use, stationery articles, wallpaper and other paper or cardboard articles;
- 'furniture making' (C41 in NES): manufacturing of chairs, office and shop furniture, kitchen furniture, accessory furniture, garden and other outside furniture; associate upholstery industries; mattress manufacturing;
- 'paper pulp, paper and cardboard manufacturing' (F31 in NES).

Considering the sharp rise in services, two ratios are given, the contribution of all branches studied for added value (and respectively GDP) for all of France, but also their contribution to the added value (and respectively to GDP) excluding service industries (i.e. only retaining agriculture, silviculture and fisheries sectors; industry, energy and construction).



Sectors completely or partially associated with wood (silviculture, logging, associated services; woodworking and wood product manufacturing; paper pulp, paper and cardboard manufacturing; paper and cardboard product manufacturing; furniture making) currently generate added value that is estimated at €15 billion/year, or 0.9% of the national added value. The contribution of the wood industry overall to the added value dropped from 1.3% in 1999 to 0.9% in 2008. It had already decreased slightly between 1990 and 2000.

There were 34 logging companies employing 20 salaried workers or more or achieving sales exceeding €5 million in 2007 (SSP, annual firm survey (EAE)). That same year, there were 4,135 logging companies overall (SSP-EAE and income tax return on business profits (BIC) of INSEE-Direction générale des impôts (DGI)). The sector is becoming increasingly concentrated from year to year: there was a total of 6,353 logging companies in 2000.

The timber and paper industry consists of three main sectors: woodworking (including sawmills), wooden furniture making and the paper industry. Each of these sectors has its own specific characteristics, which differ between sectors. Except for the pulp and paper industry and the wood-based panel industry, which are highly capitalistic and globalised, the other sectors are more dispersed and their performance varies substantially.

Wood sawing and planing activities have increased considerably in recent years, mainly due to an upswing in the building industry that started in 1997. This sector still consists of many small units but the trend is now towards corporate concentration, i.e. there were 2,065 in 2007 (Source: SSP (EAE) and INSEE-DGI (BIC)) as compared to 6,800 in 1970.

Mechanised woodworking, excluding sawmills, mainly involves wood-based panel making, framework, joinery and wooden package manufacturing. The French wood-based panel industry is a highly concentrated sector consisting of a small number of mainly medium-sized companies. The framework and joinery sector is, however, very dispersed and the wooden package making companies are also quite dispersed.

The relative share of the added value of sawing and planing within the mechanical woodworking sector is not available. It was previously determined by the Service des études et des statistiques industrielles (SESSI) of the Industry Ministry, which has now been transferred to INSEE. As a guide, this percentage was evaluated at 23% in 1997 and 28% in 2001.

The paper and cardboard product manufacturing industry consists of 75 companies, while the paper pulp manufacturing industry consists of 12 (Confédération française de l'industrie des papiers, cartons et celluloses (COPACEL), 2009 data). France is the 10<sup>th</sup> ranking world paper and cardboard producer, the 5<sup>th</sup> ranking European producer, and the 24<sup>th</sup> ranking world per-capita consumer of these products (COPACEL, 2008 data).

The relative share of the added value of wooden furniture in the furniture manufacturing sector is no longer available. It was previously determined by SESSI. As a guide, this share had been evaluated at 61% in 1997 and 64% in 2001. Wooden furniture therefore represents a major share of the global furniture manufacturing sector. Most of these companies have a salaried staff of under 50.

### Indicator 6.3

#### Net revenue of forest enterprises

#### Gross added value, mixed income and net enterprise revenue of forest enterprises (in million € 2008)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
<i>Description</i>	<i>euros 2008</i>								
Production	6 470	6 563	5 873	5 469	5 634	5 863	6 217	6 910	6 265
Service input	3 351	3 538	2 839	2 763	2 878	2 717	3 301	3 814	3 429
<i>Proportion for standing wood</i>	1 667	1 932	1 313	1 074	1 105	1 160	1 494	1 849	1 466
<b>Gross added value</b>	<b>3 119</b>	<b>3 024</b>	<b>3 034</b>	<b>2 706</b>	<b>2 756</b>	<b>3 146</b>	<b>2 916</b>	<b>3 095</b>	<b>2 836</b>
Fixed capital consumption	689	680	667	650	634	619	606	522	519
Taxes	150	140	141	146	141	137	132	140	139
Production subsidies	112	176	279	131	98	107	103	35	33
Employee compensation	810	809	813	820	816	749	776	796	776
<b>Mixed income</b>	<b>1 581</b>	<b>1 570</b>	<b>1 693</b>	<b>1 222</b>	<b>1 263</b>	<b>1 748</b>	<b>1 505</b>	<b>1 672</b>	<b>1 434</b>
Outstanding interests	30	32	29	29	28	28	27	27	26
<b>Enterprise revenue</b>	<b>1 551</b>	<b>1 538</b>	<b>1 664</b>	<b>1 194</b>	<b>1 235</b>	<b>1 720</b>	<b>1 478</b>	<b>1 646</b>	<b>1 408</b>

Source: LEF, Integrated Environmental and Economic Accounting for Forests (IEEAF).

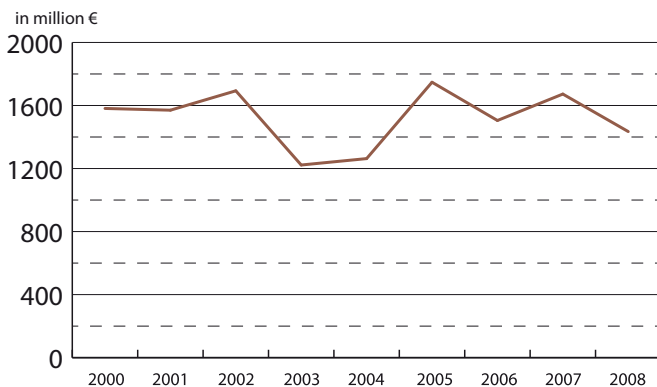


Figure 42: Mixed income variations (in million € 2008).

Source: cf. table.

Forest enterprise mixed income was estimated at €1.43 billion in 2008. Excluding inflation, there were substantial variations in added value and associated aggregates over the 2000-2008 period. These variations are primarily due to the impact of the 1999 storms. Logging of the enormous volumes of windfalls generated a high added value from 2000 to 2002, combined with an increase in subsidies, which were not maintained thereafter (2003-2004) because of the decline in removal volumes and the low prices. It was only in 2005 that net logging revenues improved because of the market recovery and a slight increase in removals. Mean stumpage prices rose from €19/m<sup>3</sup> in 2002 to €22/m<sup>3</sup> in 2008, as estimated within the framework of Integrated Environmental and Economic Accounting for Forests (IEEAF) and this includes the fuelwood self-consumption value. The payable interest is relatively steady and enterprise revenues to be paid are close to the mixed income level (€1.41 billion in 2008).

Note: IEEAF in France are developed by the Laboratoire d'économie forestière (LEF) on the basis of data of the Institut national de la statistique et des études économiques (INSEE), the French National Forest Inventory (NFI), the Office national des forêts (ONF) and the French Ministry of Agriculture, Food, Fisheries, Rural Affairs and Spatial Planning (MAAPRAT). These figures concern both silviculture and logging.

Mixed income is the sum of the gross added value (difference between production and service inputs) and production subsidies after deduction of employee salaries, taxes and consumption of fixed capital. The elements involved in this calculation are as follows (Niedzwiedz et al., 2010) :

- production: including net wood supply, mortality deducted (derived from the silviculture sector); production of construction timber, industrial timber and fuelwood (derived from the logging sector); other forest products (cork and forest plants); services (afforestation and reforestation, forest inventories, fire and dune protection, rehabilitation of mountain areas and services provided by companies).
  - service input: this mainly includes seeds and plants, energy, fertilizer, small equipment, services, as well as standing wood consumption by the logging sector (removals plus logging losses).
  - production subsidies, employee compensation, taxes and consumption of fixed capital: these data are provided by INSEE and mainly derived from Les comptes nationaux.
- The net enterprise revenue is the mixed income after deduction of rents and interest.

## Indicator 6.4

### Total expenditures for long-term sustainable services from forests

#### Total expenditures for long-term sustainable services from forests

Long-term sustainable services		Amount in million € 2010											
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Forest fire protection	Prevention	34.0	34.3	34.8	36.7	30.7	31.9	31.0	30.5	29.8	29.7	28.8	26.9
	Control	84.5	86.1	93.0	107.1	200.6	129.5	133.9	145.2	117.0	100.6	116.7	98.0
<b>Subtotal forest fire protection</b>		<b>118.5</b>	<b>120.4</b>	<b>127.8</b>	<b>143.8</b>	<b>231.2</b>	<b>161.4</b>	<b>164.8</b>	<b>175.7</b>	<b>146.7</b>	<b>130.2</b>	<b>145.6</b>	<b>124.9</b>
Mountain landscape rehabilitation		9.7	12.6	7.4	20.5	18.3	14.3	15.2	18.8	17.7	17.6	17.7	16.5
Coastal dune protection		0.6	0.0	1.0	1.3	1.4	1.3	0.9	0.8	0.8	0.8	0.8	0.8
<b>Subtotal mountain and dunes</b>		<b>10.2</b>	<b>12.6</b>	<b>8.4</b>	<b>21.8</b>	<b>19.6</b>	<b>15.6</b>	<b>16.1</b>	<b>19.7</b>	<b>18.6</b>	<b>18.5</b>	<b>18.5</b>	<b>17.3</b>
Natura 2000 contracts, forest dispositions		0.0	0.0	0.0	NA	NA	NA	NA	NA	0.2	0.5	0.6	0.5
Biological reserves		0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3

Sources: French Ministry of the Interior, Overseas Territories and Local Authorities, and the Ministry of Immigration, for fire control French Ministry of Agriculture, Food, Fisheries, Rural Affairs and Spatial Planning (MAAPRAT) for fire prevention, mountain landscape rehabilitation and coastal dune protection.

French Ministry of Ecology, Sustainable Development, Transportation and Housing (MEDDTL) for Natura 2000 contracts and biological reserves.

Note:

#### Forest fire control

–The French Ministry of the Interior provides national funding for forest fire control, while managing most of the airborne fire fighting operations in France. A small share of these expenses concern prevention. Until 2009, 60% of the military training costs for civil protection was allocated to forest fire control. This percentage decreased to 38% in 2010 due to major operational involvement in other areas. At these rates, this cost represented €49 million in 2009 and €35 million in 2010.

–Expenditures of the Services départementaux d'incendie et de secours (SDIS) for forest fire fighting is not included since joint SDIS cost accounting and complementary expertise would be necessary to determine the exact figures, but they were estimated at €231 million (Chatry et al., 2010).

#### Fire prevention

–Forest fire prevention expenses only concern MAAPRAT credits and, since 2007, the self-financing share of the Office national des forêts (ONF) for general interest missions (in compliance with the State-ONF 2007-2011 contract).

–MEDDTL expenditures are not included (currently estimated at €1-2 million/year) for fire prevention, essentially for implementing natural forest fire hazard prevention plans (PPR). The share of their cost relative to all PPRs is not available.

–European funds mobilized in implementing rural development plans (European Agricultural Fund for Rural Development (EAFRD)) are also not included.

#### Other forest fire protection initiatives (prevention and control)

–The table does not include indirect costs of various other administrations for fire control and prevention, estimated at €13 million, those of local authorities (excluding SDIS), estimated at €98.5 million, and those for network managers, individuals and private owners, estimated at €13 million (Chatry et al., 2010).

#### Forest ecosystem protection

–For management of the European Natura 2000 network, amounts invested by the State for forest measures from 2007 to 2009 (there was no distinction between the different measures before this date) are indicated.

–European EAFRD credits are not included, nor are expenditures associated with drawing up and implementing documents of objectives, despite their high number. As a guide, the percentage concerning forests of costs for drawing up and implementing documents of objectives was roughly estimated by MEDDTL—on a pro rata basis with respect to the forest area at Natura 2000 sites—at €7.3 million in 2010 (an amount that has remained relatively steady in recent years).

–Expenses associated with biological reserves concerning MEDDTL funding, as of 2002, for biological reserves in public forests (as part of a State-ONF contract).

#### Public accommodation

–Expenditures for tourism-related work by ONF were estimated at €20 million in 2008, while ecological work was estimated at €25 million, but these estimations are only partial. They include expenditures devoted entirely to these services, in addition to a low estimate of the lump sum for regular work (tree marking, development projects, etc.) devoted to these services.

The main long-term sustainable services from metropolitan forests are forest fire protection (prevention and control), mountain land rehabilitation, coastal dune protection, expenditures for the Natura 2000 network and biological reserves. Total expenditures for these services in 2010 are estimated at €143 million. The sharp rise in 2003 is linked with the many forest fires that occurred during the summer drought-heat wave period: forest fire control expenditures incurred by the French Ministry of the Interior thus reached €200 million that year. There is always a greater proportion of expenditures for forest fire protection, even in average years.

The French Ministry of the Interior is generally responsible for implementing forest fire control policies (Chatry et al., 2010), i.e. defining certain prevention guidelines, standards for equipment involved and control strategies based on quick intervention to extinguish fire starts. Fire control expenditures are divided between airborne and military civil protection deployment and subsidies (including support groups). Over the last two decades, the heavy airborne fire fighting equipment capacity (Trackers, Canadairs, Dash) has remained steady, but the costs have increased with the efficiency of the aircraft. Over the same period, the staff and the availability of civil protection intervention units decreased slightly, but staff training and equipment improved, so their capacity generally remained stable. However, their cost increased sharply. Forest fire control expenditures may vary between years depending on the extent of interventions, which can in turn influence the aircraft deployment conditions, and potential acquisitions of air tankers to replace wrecked aircraft.

Forest fire prevention policies are implemented by MAAPRAT, in conjunction with the Ministry of the Interior, MEDDTL, territorial communities and forest owners (authorized union associations (ASA) of Aquitaine). These policies focus on four issues:

- hazard forecasting;
- forest fire monitoring for fire start detection and quick intervention on incipient fires;
- equipment and maintenance of forest fire protection structures (DFCI), development and management of forest areas;
- public awareness and professional training.

Forestry Ministry expenditures concern forest labour staff specialized in DFCI work, forest fire monitoring and fire start control teams, subsidies for investments and DFCI activities, in compliance with departmental and regional forest fire protection plans (PPFCI), eligible for development plans (Plan de développement rural hexagonal (PDRH) and Plan de développement rural de Corse (PDRC) for metropolitan France). These credits are decreasing for at least three reasons: the decline or maintenance of numbers of certain specialized DFCI staff, the decrease in State subsidies to French departments for forest fire fighters and the decrease in annual zonal credit allocations for the 'Prometheus' zone in 15 Mediterranean departments (ex-Mediterranean forest conservatory).

Mountain landscape rehabilitation and coastal dune protection are undertaken by ONF for MAAPRAT.

Mountain landscape rehabilitation activities of ONF concern:

- active protection: torrent control, drainage of waterlogged soils, biological engineering work;
- close protection to complement active protection: containment or deviation of dangerous material flows.

ONF is also involved in various mountain hazard prevention operations for the French Ministry of the Environment. It is in particular responsible for the management of databases on mountain hazards, permanent avalanche monitoring in partnership with the Institut de recherche pour l'ingénierie de l'agriculture et de l'environnement (CEMAGREF), and the development of hazard prevention guidelines.

In addition, ONF stabilises and maintains dunes on the edge of state-owned forests by planting vegetation (arenaceous plants) and installing windbreaks, safety fences and walking paths. Most of these operations are focused on dunes along the Atlantic coast. ONF outlined initiatives to be implemented on the basis of three key objectives: controlling erosion in the dune environment and preserving or enhancing its biodiversity, providing public access without disturbing natural balances, and renewing forest stands essential for the management of coastal areas.

The aim of the Natura 2000 network is to contribute to preserving biodiversity throughout Europe. It consists of special sites designated by Member States. In France, the Natura 2000 network currently covers over 6.9 Mha, or around 12.5% of the total area. Management measures outlined in documents of objectives drawn up for each site can be implemented through a Natura 2000 contract and benefit from both State and European funding. The first contracts were signed in 2003. The initiatives implemented most in forest areas correspond to projects that promote the development of senescent woodlands, the creation or rehabilitation of clearings or heathlands, and unwanted species control operations (ASP, 2010).

## Indicator 6.5

Number of persons employed and labour input in the forest sector, classified by gender and age group, education and job characteristics

### Employment in the wood sector (thousands of persons in full-time equivalents (FTE)).

		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Silviculture and logging	Total employment FTE	39.9	38.3	38.3	35.5	32.4	31.0	30.8	30.9	30.5	29.4
	Salaried employment FTE	30.5	29.0	29.1	26.5	23.6	22.4	22.3	22.6	22.5	21.8
	Independent employment	9.4	9.3	9.2	9.0	8.8	8.7	8.5	8.3	8.0	7.7
	% independent	23.6%	24.3%	24.1%	25.4%	27.3%	28.0%	27.7%	26.8%	26.2%	26.1%
Woodworking and wood product manufacturing	Total employment FTE	91.4	91.2	90.9	90.6	90.8	89.1	85.8	85.6	85.5	85.2
	Salaried employment FTE	85.0	84.7	84.5	84.1	84.4	82.8	79.4	79.1	79.0	78.6
	Independent employment	6.4	6.4	6.4	6.5	6.4	6.3	6.3	6.5	6.5	6.5
	% independent	7.0%	7.1%	7.1%	7.1%	7.0%	7.0%	7.4%	7.6%	7.6%	7.7%
Paper pulp, paper and cardboard manufacturing	Total employment FTE	26.1	25.9	25.7	25.4	25.1	25.3	24.4	24.3	23.4	22.2
	Salaried employment FTE	25.9	25.7	25.6	25.3	25.0	25.2	24.3	24.2	23.2	22.1
	Independent employment	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	% independent	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.6%
Paper and cardboard product manufacturing	Total employment FTE	60.2	59.4	60.3	58.9	57.6	56.2	53.8	49.5	48.2	47.4
	Salaried employment FTE	59.4	58.6	59.5	58.1	56.8	55.4	53.1	48.7	47.5	46.6
	Independent employment	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	% independent	1.3%	1.3%	1.3%	1.3%	1.3%	1.4%	1.4%	1.6%	1.6%	1.7%
Furniture making (wood and non-wood)	Total employment FTE	123.7	125.5	128.1	124.3	121.1	116.5	112.9	108.3	104.8	101.5
	Salaried employment FTE	106.6	108.3	110.9	107.2	104.3	100.0	96.4	91.6	88.3	85.0
	Independent employment	17.1	17.2	17.2	17.2	16.8	16.5	16.5	16.7	16.6	16.5
	% independent	13.8%	13.7%	13.4%	13.8%	13.9%	14.2%	14.6%	15.4%	15.8%	16.3%
Total all sectors	Total employment FTE	341.2	340.1	343.4	334.8	327.0	318.2	307.7	298.6	292.4	285.7
	Salaried employment FTE	307.4	306.3	309.7	301.2	294.1	285.9	275.5	266.2	260.4	254.1
	Independent employment	33.8	33.8	33.8	33.6	32.9	32.3	32.2	32.4	32.0	31.6
	% independent	9.9%	9.9%	9.8%	10.0%	10.1%	10.2%	10.5%	10.8%	10.9%	11.1%
Total France	Total employment FTE	23 204.6	23 867.2	24 369.3	24 577.4	24 599.5	24 628.6	24 774.9	25 031.2	25 431.7	25 617.1
	Salaried employment FTE	20 673.3	21 340.7	21 863.8	22 084.1	22 117.3	22 125.6	22 246.6	22 476.2	22 852.5	23 021.9
	Independent employment	2 531.3	2 526.5	2 505.5	2 493.3	2 482.1	2 503.0	2 528.3	2 555.1	2 579.1	2 595.2
	% independent	10.9%	10.6%	10.3%	10.1%	10.1%	10.2%	10.2%	10.2%	10.1%	10.1%

Source: Institut national de la statistique et des études économiques (INSEE), Comptes Nationaux – basis 2000, according to the Nomenclature économique de synthèse (NES).

Note: As for Indicator 6.2, the data used are from the INSEE Comptes Nationaux (2000 basis), contrary to the ISFM 2005 edition. This source has the advantage of being uniform and continuous over time. However, it does not enable a detailed breakdown by activity. Activities in each sector are described in Indicator 6.2. Work accomplished in the silviculture sector is especially hard to quantify because forest owners carry out much of the work themselves, and this is not accurately monitored by regular statistical surveys. However, the last survey of the Service central des enquêtes et études statistiques (SCEES, now the Service de la statistique et de la prospective (SSP)) in 1999 on the private forest property structure enabled an estimate of silviculturist forest owner labour input at 11 million days per year, or 49,000 full-time equivalents (FTE).

The data used underestimates employment in the forest-wood sector. This sector also employs personnel for upstream activities (ministries, French National Forest Inventory (NFI), forest development organizations, staff of the Office national des forêts (ONF), research and technical institutions, professional organizations, education and training, hunting) and downstream activities (machinery and equipment manufacturing, construction, wood marketing, chemistry of forest products). However, specific analyses would be required to be able to determine the number of people solely involved in the forest-wood sector, otherwise the breakdown is not possible (INSEE, 2006).

The forest-wood sector employs around 286,000 full-time equivalents, or 1.1% of the total employed labour force. The distribution per sector clearly shows that the furniture making sector predominates, with 36% of the workforce, followed by woodworking and wood product manufacturing (30%), paper and cardboard product manufacturing (17%), silviculture and logging (10%) and finally by paper pulp, paper and cardboard manufacturing. However, as mentioned in the note, taking the work carried out by silviculturist forest owners into account (estimated at 49,000 FTE by SCEES in 1999) would increase the share of the silviculture-logging sector to 22% of the total, i.e. 335,000 FTE.

Many independent employees work in the silviculture and logging field, representing 26.1% of all employment in 2008, whereas they only account for 0.6% of jobs in the paper pulp, paper and cardboard manufacturing sector. Throughout the industry, independent employees represent 11.1% of the jobs, a rate close to that of the entire workforce in France.

In addition, according to a study carried out in 1998 (Association forêt-cellulose, Serge Lochu Consultant, 2001), 235,000 jobs have been indirectly induced by the forest-wood sector, especially in the construction, intermediate goods, energy and financial sectors.

The Agence de l'Environnement et de la maîtrise de l'énergie (ADEME) commissioned a study to assess employment in the biofuel sector, ranging from biofuel production (wooden logs, chips, pellets, by-products, straw, fuel crops), to their storage (storage platform) and use (stoves and fireplaces, wood boilers, collective boilers and cogeneration units). In this study (Algoé and Blézat Consulting, 2007), it was estimated that there were 60,000 direct and indirect jobs in the biofuel sector in 2006, including 40% informal jobs. According to this study, 90% of the employment in the sector are associated with wooden logs and individual heating equipment (individual wood stoves, fireplaces and inserts; 55% and 35% of these jobs, respectively). 74% of the jobs associated with wooden logs are informal.

The employed labour force involved in the forest-wood sector has been declining in a trend-setting way for several decades. The total full-time equivalent employment has thus decreased from 341,000 in 1999 to 286,000 in 2008.

On the basis of the Comptes nationaux data, it is not possible to know the job distribution by gender, age and

educational level. Otherwise, data from the statistical office of the European Union (EUROSTAT) Labour Force Survey (LFS), and the INSEE employment survey give an indication of this distribution. It should, however, be kept in mind that the sample concerning the wood sector is too small to be representative, so the data accuracy is poor. The LFS indicates that male employment largely prevails in the wood sector, with the proportion of female employees roughly around:

- 10% in the silviculture, logging and associated services sector;
- 20% for the woodworking and wood product manufacturing sector;
- 30% for the paper and cardboard manufacturing sector.

The proportion of employees over 50 years old is around 20% in these sectors. Finally, there seem to be fewer unqualified jobs than in the workforce, whereas there seem to be more midrange jobs. The training level seems to have progressed in all sectors. The paper and cardboard manufacturing sector has the highest percentage of high level jobs. Irrespective of the sector, 75-85% of all employees have not attended university.

## Indicator 6.6

### Frequency of occupational accidents and occupational diseases in forestry

#### Frequency of occupational accidents and occupational diseases of self-employed workers (excluding 'child victims' and 'solidary contributors') in the forest sector in metropolitan France, excluding Alsace-Moselle

	2004	2005	2006	2007	2008	2009
Affiliated during the period	6 807	6 730	6 726	6 749	6 719	6 501
Occupational accident, with work stoppage	699	721	671	634	605	517
Occupational accident, fatal	4	3	5	12	8	6
Occupational disease, with work stoppage	16	12	16	20	14	14

Source: Mutualité sociale agricole (MSA).

#### Occupational accidents and occupational diseases of salaried workers in the forest sector in Alsace-Moselle

	2007	2008	2009
Occupational accident, with work stoppage	500	442	413
Occupational accident, fatal	1	1	2
Occupational disease, with work stoppage	31	31	32

Source: Statistical statements on occupational accidents and diseases supplied by the Caisses d'Assurance-Accident Agricoles (CAAA).

After a marked decrease from 1979 to 1988, the occupational accident frequency rate in the forestry sector levelled off until 2001, with a slight improvement beginning in 2002 (see Table p. 144). The trends varied in the different subsectors. Logging is traditionally the worst subsector for accidents, even though the frequency rate has decreased as in other sectors. Silviculture ranked second in terms of occupational accident frequency. The pattern for the resin tapping sector is highly variable because of the low hourly volume concerned (0 to 10,000 h since 1992).

The increase in occupational diseases is generally linked to periarticular diseases, which were first taken into account in 1984. There is usually a rather long period between the exposure to a risk and detection of the disease. Several explanations for this phenomenon are possible but the fact that employees declare their health problems more systematically seems to play an important role, thus suggesting that this is mainly an 'administrative follow-up' indicator rather than an indicator reflecting an increase in occupational hazards.

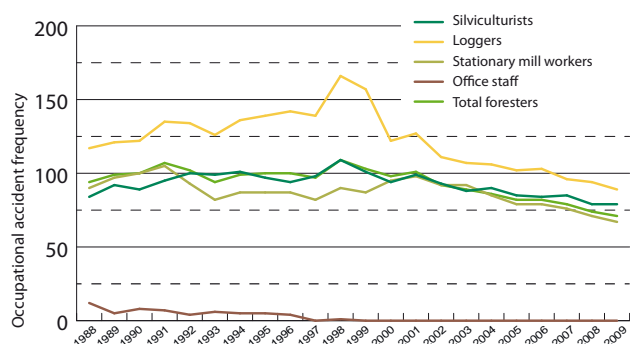


Figure 43: Variations in the frequency of occupational accidents (number of accidents with work stoppage per million work hours declared) for salaried employees in the forest sector (excluding resin tapping).

Source: Mutualité sociale agricole (MSA).

**Frequency of occupational accidents and occupational diseases of salaried workers in the forest sector in metropolitan France, excluding Alsace-Moselle**

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>Salaried workers</b>																						
Number of work hours (x 1,000)	70 558	69 707	69 439	62 934	65 771	61 926	58 618	61 173	60 512	59 120	55 043	53 365	58 616	54 418	50 854	48 822	45 939	44 235	44 152	43 880	42 958	40 094
<b>Accidents with work stoppage</b>																						
Number total	6 620	6 908	6 957	6 716	6 712	5 843	5 816	6 105	6 049	5 748	6 019	5 520	5 753	5 508	4 654	4 362	3 962	3 608	3 612	3 453	3 187	2 839
Number serious fatal	15	11	10	14	12	25	12	14	18	13	13	15	20	19	8	13	3	10	7	10	11	8
Frequency rate total	93.8	99.1	100.2	106.7	102.1	94.4	99.2	99.8	100.0	97.2	109.4	103.4	98.1	101.2	91.5	89.3	86.2	81.6	81.8	78.7	74.2	70.8
Frequency rate fatal	0.2	0.2	0.1	0.2	0.2	0.4	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.1	0.2	0.2	0.2	0.3	0.2
<b>Occupational diseases with work stoppage</b>																						
Total number	14	16	22	16	25	26	34	33	52	63	64	84	89	130	127	142	109	143	161	130	137	137

Source: Mutualité sociale agricole (MSA).

Note: As Alsace and Moselle have a different system for occupational accidents, the sources and data used differ.

Data on salaried workers concern those involved in silviculture, resin tapping, logging, stationary mills and associated offices.

For self-employed workers, since 1 April 2002, the 'occupational accidents and professional diseases' insurance plan for farm operators has become an obligatory social protection branch. Members may obtain insurance through MSA or the Association des Assureurs (which has delegated the Réunion de sociétés d'assurances). Since that date, MSA utilizes statistical data for occupational accidents and professional diseases derived from agencies of MSA agencies and the insurance provider group. Data on self-employed workers concern those involved in silviculture, logging and stationary mills.

Only occupational accidents per-se are recorded. Commuting accidents which, according to the French labour code, are classified as occupational accidents for salaried worker entitlements, are not included here since they are not hazards associated with the type of professional activity.

The accident frequency rate represents the number of accidents with work stoppage per million declared work hours. It is irrelevant to calculate this frequency rate for professional diseases since the period between an exposure to a hazard and detection of a professional disease can be quite long. Moreover, the extent to which these diseases are accounted for varies highly depending on the type of disease and the geographical area where the individual is located, so it is more an administrative monitoring indicator. For self-employed workers, this frequency rate cannot be calculated because the work hours are not recorded.



## Indicator 6.7

### Per capita consumption of wood and products derived from wood

#### Apparent consumption of wood and products derived from wood in France

Apparent consumption of wood and wood-derived products	1990	1995	2000	2005	2006	2007	2008	2009
Total (million m <sup>3</sup> roundwood equivalents)	113	113	122	121	120	117	114	115
Per capita (m <sup>3</sup> roundwood equivalents/capita)	1.99	1.95	2.06	1.98	1.95	1.90	1.83	1.85

Sources: United Nations Economic Commission for Europe (UNECE)/Food and Agriculture Organization of the United Nations (FAO) (French data transmitted for the Joint Forestry Sector Questionnaire (JFSQ)), published in the ForesStat database) for data related to wood and wood-derived products; United Nations population division (data published in the PopStat database) for population.

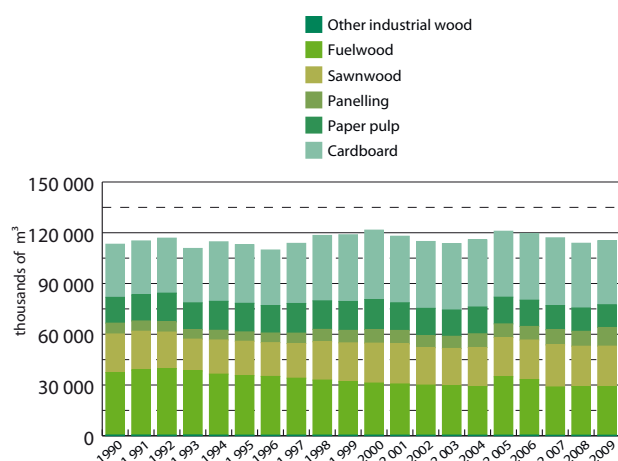


Figure 44: Variations in apparent consumption of wood and wood-derived products per product type, in roundwood equivalents (EQ) (1,000 m<sup>3</sup>).

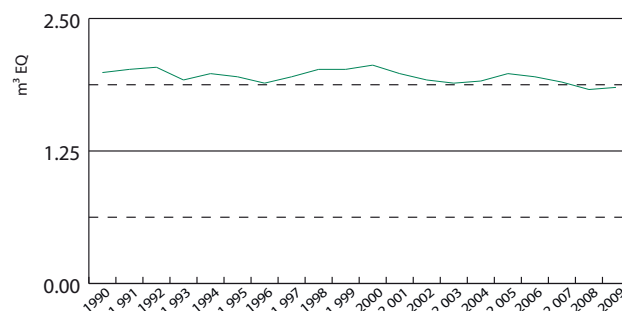


Figure 45: Variations in per capita apparent consumption of wood and wood-derived products, in roundwood equivalents (EQ).

Source: cf table.

Note: The method used is recommended by FAO for the JFSQ. The apparent consumption is defined as the sum of produced and imported quantities. Processed product volumes are converted to 'roundwood equivalents' (EQ) using technical coefficients, i.e. raw wood volumes required to manufacture these processed products, including production losses. The total wood and derivative consumption in EQ is calculated as the sum of apparent consumption of sawnwood, wooden veneer and panelling, paper pulp, cardboard, other industrial roundwood and fuelwood (marketed and self-consumed). By only considering these products, double counts are avoided (consumed construction timber is counted as sawnwood, as is pulpwood used by panelling manufacturers and pulp). The data used are what the French Service de la statistique et de la prospective (SSP) provides to FAP for the JFSQ. They are estimated on the basis of French national statistical sources: branch surveys, professional federations, Service de l'observation et des statistiques (SOeS)-Observatoire de l'Énergie and the French customs service. Since 2006, the quantities supplied by the customs service are incomplete due the lack of obligation to transmit the information, so the estimations are done by SSP within the framework of the JFSQ. Wood self-consumption estimates are provided to FAO by SSP within the framework of the JFSQ. It is calculated on the basis of the latest data from the Service de l'observation et des statistiques (SOeS) and studies (Arthur Andersen and Associates, 2000), indicating that 70% of total fuelwood consumption involves wood from forest trees, with 25% from non-forest trees and 5% recycled wood.

Total apparent consumption of wood and wood-derived products in metropolitan France was over 115 Mm<sup>3</sup> EQ in 2009, or 1.85 m<sup>3</sup> EQ/capita. Per-capita consumption declined slightly over the 1990-2009 period (-0.4%/year on average). This decrease could be partially explained by the population growth, which increased faster than wood consumption (+0.5%/year on average versus +0.1%/year, respectively), and also by the decrease in fuelwood consumption, especially self-consumption (-1.6%/year on average over the 1990-2009 period), which represents 90% of the total fuelwood consumption. However, consumption of marketed fuelwood increased (+2.0%).

Panelling consumption increased by 2.9%/year on average between 1990 and 2009. This is the result of an increasingly greater diversified supply of wood-based panelling, to fulfil the demand from construction, furniture and wooden package manufacturing industries and DIY stores. Paper and cardboard consumption has also increased since the 1990s, especially in conjunction with the marked increase in graphic paper consumption.

Wood-derived products benefit from the 'green' label trend, promoting the consumption of natural, environment-friendly products, especially fuelwood, wooden packaging, wood products used in construction and various other wooden items (useful and decorative articles). Technological improvements and the promotion of wood materials, especially for construction, seems to be starting to pay off. Wood and derivatives are being showcased as competitive, modern ecological products thanks to innovations by the Institut technologique forêt cellulose bois-construction ameublement (FCBA) and national and regional interprofessional promotion. Wood combines technical and environmental performance, and contributes to combating the greenhouse effect by sequestering carbon. It is likely that the trend towards increased certification of wood products has an impact on end consumption, but it is currently impossible to measure the apparent consumption of certified wood in France due to the lack of data.

## Indicator 6.7.1

### Salvaging and recycling cellulose fibres—upgraded related products

#### ■ Salvaging and recycling papers and cardboards

##### Variation in the consumption and salvaging of papers and cardboards

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Consumption (kt)	4 163	4 192	4 468	4 930	5 276	5 775	5 566	5 705	5 781	5 942	5 953	6 050	5 947	5 677	4 998
Utilization rate (%)	48.3	49.1	48.9	53.8	55.0	57.7	57.8	58.2	58.2	57.9	57.6	60.5	60.4	60.4	60.0
Apparent salvaging (kt)	3 705	3 857	4 220	4 669	5 037	5 299	5 350	5 581	5 938	6 417	6 568	6 951	7 091	6 885	6 907
Salvaging rate (%)	38.5	41.1	40.9	43.8	46.2	46.5	49.2	51.3	54.7	58.1	60.6	63.7	63.8	64.4	72.5

kt: 1,000 t

Source: Confédération française de l'industrie des papiers, cartons et celluloses (COPACEL).

Note: The salvaged paper and cardboard utilization rate is the consumption of paper and cardboard salvaged during the new paper and cardboard manufacturing process. It reflects variations in the percentage reuse of recycled fibre relative to total utilized fibre resources.

The salvaging rate represents the salvaging of used paper over the apparent paper and cardboard consumption. It reflects variations in the percentage consumption of paper and cardboard salvaged after utilization, and the development of the salvaging system or the increase in its efficiency.

Apparent salvaging is the consumption of salvaged paper and cardboard, plus exports and variations in stocks, minus imports.

Salvaged paper and cardboard are obtained via collections from manufacturers, households and merchants, process scrap and unsold material. They are used for manufacturing paper and cardboard instead of virgin cellulose fibre derived from wood. The salvaged paper and cardboard utilization rate has been increasing over the last 15 years. Salvaged fibre is the main source of fibre in the French paper manufacturing industry (60% utilization rate in 2009).

Paper and cardboard salvaging has developed substantially via the development of selective collection and promotion of collection, sorting and recycling to encourage the involvement of the paper manufacturing industry and all stakeholders in the recycling system. Material from almost two-thirds of all paper and cardboard products is reutilized for manufacturing new products. There is still scope for improvement with respect to paper from offices—the awareness of these stakeholders requires boosting. The objective salvaging rate for 2010 was set at 66% through a

joint European statement to partners of the Confederation of European Paper Industries (CEPI)/European Recovered Paper Association (ERPA) network. France is currently well positioned in terms of its salvaging rate relative to the average rate for all European countries (72.2% in 2009 according to the European Declaration on Paper Recycling follow-up report). However, the high salvaging rate in 2009 was circumstantial, as it was associated with the marked reduction in global paper and cardboard consumption due to the global economic situation.

The development of old paper recycling is more a response to an industrial strategy (cost reduction in the paper manufacturing industry) and waste management than a forest protection strategy, considering the moderate removal rate in France. Material salvaging transforms used products (waste) into resources, extends their service life, reduces the environmental impact of paper and cardboard products, while also reducing the quantity of waste that has to be disposed.

■ By-product processing

Variations in the quantity of processed sawmill by-products

	Units	1988	1993	1998	2004	2005	2006	2007	2008	2009
Processed sawmill by-products	1000 t	5 298	6 263	7 583	7 876	8 117	8 705	9 186	8 706	7 785
including by-products for pulping	1000 t	3 240	3 623	4 312	4 286	4 511	4 694	4 823	4 417	3 925
Production of sawnwood, cask wood and railway ties	1000 m <sup>3</sup>	10 269	9 319	10 220	9 980	9 932	10 157	10 206	9 596	8 074
Sawmill by-products/production of sawnwood, cask wood and railway ties	t/m <sup>3</sup>	0.52	0.67	0.74	0.79	0.82	0.86	0.90	0.91	0.96

Source: SSP – Wood removals and sawnwood production.

Sawmill by-products are derived from the first stage of industrial silvicultural timber processing. There are different types of these products depending on the operations from which they are derived (debarking, log milling, rip sawing, etc.): chips and shavings, sawdust, bark and short offcuts. Their use enhances the cost-effectiveness of saw mills and reduces pulp industry supply costs, while improving the efficiency of wood material utilization. These by-products are also used to supply urban and industrial boiler plants, thus generating conflicts of use with cellulose pulp and panelling manufacturers.

The quantity of processed sawmill by-products reached 7.8 million t in 2009. Following a steady increase for over 20 years, it stalled in 2008 and 2009 due to the economic crisis. Relative to the production of sawnwood, cask wood and railway ties, it was 0.96 t/m<sup>3</sup> in 2009. The share targeted for

pulping (chips and offcuts) has been decreasing over time, i.e. from 61% in 1998, but it was still around 50% in 2008 and 2009.

The volume of unmarketed waste was 0.4 million t in 2009. 568,000 t of by-products used for energy production were marketed in 2009 (sharply increasing trend), whereas 256,000 t were self-consumed by the manufacturing companies (also sharply increasing trend).

## Indicator 6.8

*Imports and exports of wood and products derived from wood*

### ■ Trade balance in volume (in roundwood equivalents)

#### ■ Restricted range (European requirement): excluding secondary manufactured products (except for paper and cardboard) (see Note)

Trade balance in roundwood equivalents (EQ), based on the method used for the Joint Forestry Sector Questionnaire (JFSQ) survey conducted for the Food and Agriculture Organization of the United Nations (FAO).

	Quantities (million m <sup>3</sup> roundwood equivalents)						
	1990	1995	2000	2005	2006	2007	2008
Exports	13.1	19.0	25.2	31.0	31.2	29.8	27.7
Imports	28.1	29.1	40.4	41.2	42.2	43.4	41.0
<b>Balance</b>	-15.0	-10.1	-15.1	-10.1	-11.0	-13.7	-13.4

Sources: United Nations Economic Commission for Europe (UNECE)/Food and Agriculture Organization of the United Nations (FAO) (French data transmitted for the Joint Forestry Sector Questionnaire (JFSQ), published in the ForesStat database). FAO for conversion coefficients.

#### ■ Expanded range (national adaptation): including all secondary manufactured products (see Note)

Trade balance in roundwood equivalents, based on the method used by the Laboratoire d'économie forestière (LEF).

	Quantities (millions m <sup>3</sup> roundwood equivalents)						
	1990	1995	2000	2005	2006	2007	2008
Exports	23.4	27.9	41.2	47.6	48.4	48.7	46.6
Imports	37.0	42.3	57.3	58.7	59.8	62.9	59.5
<b>Balance</b>	-13.6	-14.3	-16.1	-11.2	-11.5	-14.2	-12.9

Sources: Laboratoire d'économie forestière (LEF) – Trend chart for the wood industry. According to data from the French customs service published by AGRESTE and estimates of the Service de la statistique et de la prospective (SSP) for the missing data. LEF for conversion coefficients in roundwood equivalents (EQ) (including coefficients for secondary manufactured products) and SSP for the other coefficients.

Note: Processed product volumes were converted into roundwood equivalents (EQ – cf. Indicator 6.7) using technical coefficients.

The method implemented in the 'restricted range' table is that used for the JFSQ survey conducted by SSP for FAO, as for Indicator 6.7. This questionnaire also serves as a reference for the report on forest sustainable management indicators in Europe, which was filled in during the Forest Europe Ministerial Conference. The following products are taken into account: fuelwood, other industrial roundwoods, sawnwood, wood-based veneers and panelling, paper pulp and paper and cardboard.

The method used in the 'expanded range' table is that of LEF, which covers a broader range than the 'restricted range' table since it includes all roundwoods, wood and paper waste and secondary manufactured products. The following products are taken into account: rough timber, sawnwood, sawnwood by-products, veneers and plywood, reconstituted wooden panels (particle and fibre panels), pulp, rough paper and cardboard, old paper and secondary manufactured products (furniture, packaging, construction timber, various wooden items).

SSP, the French FAO correspondent for the JFSQ, uses French customs data. However, since 2006, quantities provided by the French customs service are incomplete due to the lack of obligation to transmit data. The estimates are thus done by SSP within the framework of the JFSQ.

The French trade balance in volume, regardless of the method used, is negative.

In 2008, France imported 28 Mm<sup>3</sup> EQ of wood and derivative products (60 Mm<sup>3</sup> EQ when including all rough timber, waste and secondary manufactured products) while exporting 41 Mm<sup>3</sup> EQ (47 Mm<sup>3</sup> EQ in the expanded range). The trade balance deficit in volume is thus almost 13 Mm<sup>3</sup> EQ.

The trade deficit declined between 2003 and 2006, with an export volume that increased faster than the import volume, but it began increasing again in 2007, and this trend worsened in 2008 with the economic crisis which stalled trade.

The main imported products (cf. Figure 46) are paper and cardboard (38%) sawnwood (12%) and paper pulp (15%), whereas the top export volumes concern paper and cardboard (38%), old paper (18%), roundwood (18%) and packaging (18%).

France has a high deficit with respect to paper pulp (-5.7 Mm<sup>3</sup> EQ), rough paper and cardboard (-4.9 Mm<sup>3</sup> EQ), sawnwood (-4.8 Mm<sup>3</sup> EQ) and wooden furniture (-3.2 Mm<sup>3</sup> EQ). However, our trade balance is positive for old paper, roundwood and packaging (+4.6 Mm<sup>3</sup> EQ, +1,6 Mm<sup>3</sup> EQ and +1,6 Mm<sup>3</sup> EQ, respectively).

The main partners of France are generally other European countries. For imports, its main partners are Germany, Belgium, Luxembourg, Finland, and Congo and Gabon for tropical wood, whereas for exports Spain, Belgium, Luxembourg, Germany and Italy top the list.

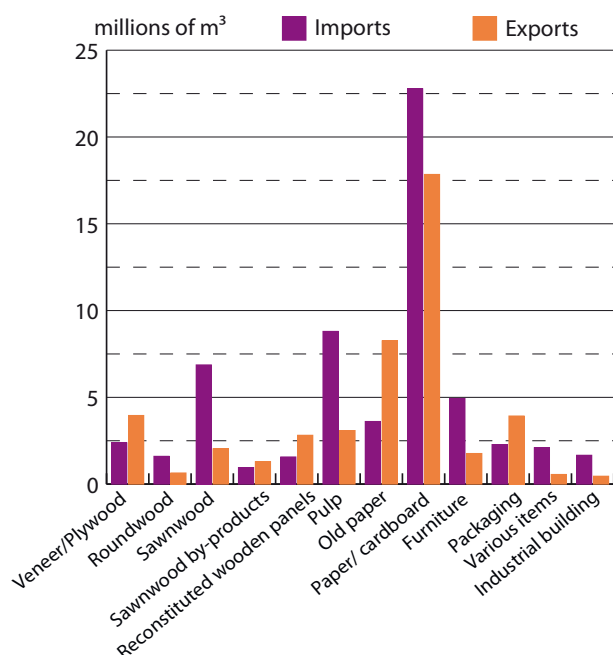


Figure 46: Imports and exports in roundwood equivalents and derived products by product type in 2008.

Source: Laboratoire d'économie forestière (LEF).

## Trade balance in value (in million € 2008)

The European indicator (for the Forest Europe Ministerial Conference) just requires the volume calculation, so only the trade balance in value determined by the LED method (national method) is presented here.

### Trade balance in value based on Laboratoire d'économie forestière (LEF) data

	Values (million € 2008)						
	1990	1995	2000	2005	2006	2007	2008
Exports	5 785	6 734	8 980	8 166	8 351	8 554	7 955
Imports	10 607	9 548	13 164	11 934	12 301	13 504	12 859
<b>Balance</b>	<b>-4 823</b>	<b>-2 814</b>	<b>-4 183</b>	<b>-3 768</b>	<b>-3 950</b>	<b>-4 950</b>	<b>-4 904</b>

Sources: Laboratoire d'économie forestière (LEF) – Trend chart for the wood industry. According to French customs data published in Agreste. The transaction amount is expressed for imports in terms of CIF (cost, insurance, freight) and for exports in FOB (free on board). 8-figure Combined Nomenclature is used.

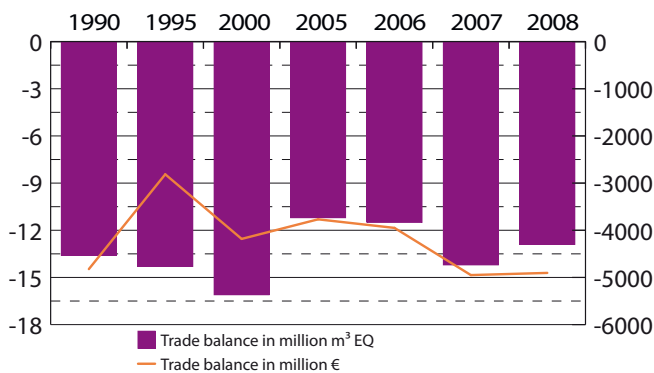


Figure 47: Trade balance of the wood sector in million m<sup>3</sup> of roundwood equivalents and constant million € 2008.

Source: Laboratoire d'économie forestière (LEF).

Note: The data are derived from LEF studies and in line with the 'expanded range' table for the trade balance in volume.

The products taken into account are: rough timber, sawnwood, sawnwood by-products, veneers and plywood, reconstituted wooden panels (particle and fibre panels), pulp, rough paper and cardboard, old paper and secondary manufactured products (furniture, packaging, construction timber, various wooden items).

France had a negative foreign trade balance of nearly €5 billion for the entire wood sector in 2008. In relative value, exports increased faster than imports between 1990 and 2008 (+1.8% per year versus +1.1% per year, and the 2008 deficit level is equivalent to the 1990 level).

There were still clear variations over the period, with an improvement in the trade balance in the mid-1990s, which was halted by the impact of the storms in 1999 and in the 2000s, with a decline at the end of the period, likely due to the international economic crisis in 2008.

As for the trade balance in volume, the main partners of France are other European countries, in addition to China for processed wood products.

In 2008, 43% of the deficit could be explained by the poor trade balance for furniture (wooden furniture and chairs). The deficit for sawnwood, paper pulp and paper and cardboard are equal, with each representing around 15% of the overall deficit. Although the trade balance deficit for sawnwood tended to increase, that of paper pulp and paper and cardboard improved markedly (an almost twofold decrease between 1990 and 2008).

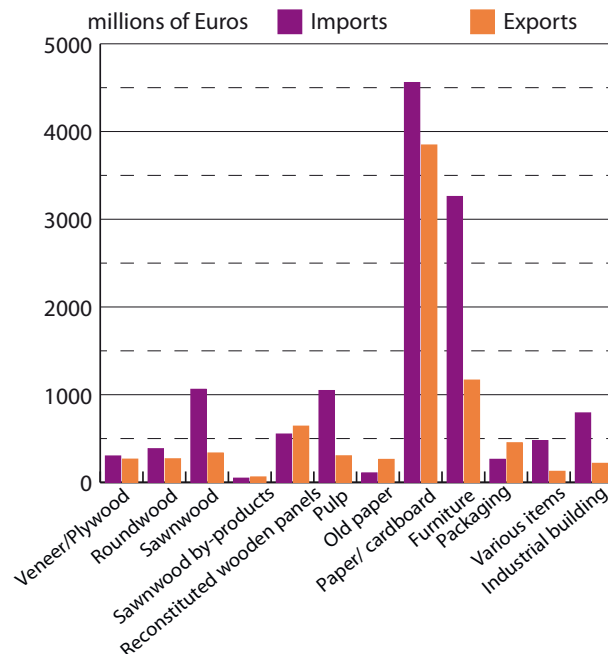


Figure 48: Imports and exports in million € of wood and derived products by product type in 2008.

Source: Laboratoire d'économie forestière (LEF).

The main excess products are packaging, old paper and reconstituted wooden panels (particle and fibre panels).

In 2008, although the roundwood trade balance was positive (1.6 million m<sup>3</sup> EQ), it was slightly negative in value (-€36 million). This shows that imported woods have a much higher unit price than exported wood (€127 versus €67 on average in 2008). This could be explained by two factors: the mean unit price for imported construction timber is 49% higher than the unit price of imported pulpwood, whereas in exports the same ratio is only 18%, and the percentage of pulpwood is higher in exports.

The wood industry deficit represents 9% of the French trade balance deficit and 0.3% of the national gross domestic product (GDP). Better wood mobilization, especially in private forests, and better supply structuring via strengthening of interprofessional organizations are potential ways to reduce the deficit in the forest wood sector.

## Indicator 6.9

Share of wood energy in total energy consumption, classified by origin of wood

## Share of wood energy in total energy consumption for metropolitan France

Period	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 provisoire
<b>Primary production in KTOE – all renewable energies</b>	15 932	16 797	15 150	15 786	16 106	15 764	16 329	17 163	19 690	20 399	22 745
1.1 Primary production in KTOE – all electrical renewable energies	5 823	6 468	5 272	5 153	5 233	4 568	5 049	5 375	6 008	5 636	6 299
1.2 Primary production in KTOE – all thermal renewable energies	10 109	10 329	9 878	10 633	10 873	11 197	11 281	11 789	13 682	14 764	16 446
<i>proportion of primary production in KTOE – wood energy</i>	8 281	8 424	7 852	8 456	8 521	8 572	8 294	8 104	8 726	8 997	10 100
<i>share of wood energy in the primary production of renewable energies</i>	52.0%	50.1%	51.8%	53.6%	52.9%	54.4%	50.8%	47.2%	44.3%	44.1%	44.4%
<b>Gross renewable electrical energy production standardized in GWh</b>	-	-	-	-	-	70 537	71 497	72 633	74 946	76 323	78 679
<i>proportion of wood energy</i>	1 090	1 044	1 109	1 132	1 129	1 254	1 250	1 364	1 409	1 234	1 360
<i>share of wood energy in standardized gross renewable electrical energy production</i>	-	-	-	-	-	1.8%	1.7%	1.9%	1.9%	1.6%	1.7%
<b>Final renewable thermal energy consumption based on the RE Directive</b>	-	-	-	-	-	9 280	9 246	8 970	9 937	10 773	12 216
<i>proportion of wood energy</i>	8 125	8 285	7 705	8 306	8 372	8 371	8 099	7 656	8 198	8 648	9 724
<i>share of wood energy in final renewable thermal energy consumption</i>	-	-	-	-	-	90.2%	87.6%	85.3%	82.5%	80.3%	79.6%
<b>Final consumption in transport in KTOE</b>	-	-	-	-	-	547	855	1 578	2 446	2 620	2 863
<i>proportion of biofuel</i>	334	334	332	336	340	403	710	1 430	2 284	2 463	2 642
<b>Final consumption all renewable energies in KTOE</b>	-	-	-	-	-	15 749	16 105	16 646	18 666	19 800	21 690
<i>proportion of wood energy</i>	-	-	-	-	-	8 479	8 206	7 773	8 320	8 754	9 841
<i>share of wood energy in final consumption of all renewable energies in KTOE</i>	-	-	-	-	-	53.8%	51.0%	46.7%	44.6%	44.2%	45.4%
<b>Consumption of primary energy by form of energy, with corrections for climate, in MTOE</b>	267.0	268.2	271.7	270.7	274.2	275.1	273.9	273.9	273.2	261.4	265.8
Charcoal	14.2	12.4	12.8	13.6	12.9	13.4	12.4	12.9	12.1	10.7	11.4
Oil	95.0	95.1	93.3	91.3	92.5	91.4	91.3	90.9	88.4	85.0	82.0
Gas	37.4	38.3	40.0	39.1	39.8	40.7	40.1	40.3	40.4	38.7	40.1
Primary electricity (nuclear, hydraulic, wind-generated and photovoltaic)	108.9	110.9	113.5	114.9	117.1	117.4	117.6	116.1	117.0	110.7	115.1
Renewable energies	11.6	11.6	11.7	11.8	11.9	12.3	12.5	13.8	15.3	16.3	17.1
<b>Final energy consumption, with corrections for climate, in MTOE</b>	157.3	159.4	160.5	159.4	160.3	160.3	161.3	161.2	161.4	155.5	157.7

Source: Service de l'observation et des statistiques (SOeS). KTOE: thousands of tonnes of oil equivalents, MTOE: millions of tonnes of oil equivalents, GWh: giga-Watt-hour, RE Directive: Renewable Energy Directive



## Distribution of the total energy production based on wood origin

	TJ/year	KTOE/year
Energy directly drawn from fuelwood	306 109	7 306
<i>drawn from forest and other wooded lands</i>	218 163	5 207
<i>drawn from trees outside forests</i>	87 946	2 099
Energy produced by related products and wood industry residue	92 181	2 200
<i>solid related products (offcuts, sawdust, bark, excluding transformed products listed below)</i>	50 711	1 210
<i>liquid residue of pulp and paper industry (mainly black liquor)</i>	41 470	990
Energy drawn from wood products transformed for energy purposes (charcoal, pellets, briquettes, chips, etc.)	5 662	135
Energy drawn from salvaged wood (from building construction or demolition, pallets, etc.)	20 717	494
<b>Total energy production from wood</b>	<b>424 669</b>	<b>10 135</b>

Source: SSP (based on the Joint Wood Energy Enquiry 2007 filled for FAO). TJ: terajoule (1012 joules), KTOE: thousands of tonnes of oil equivalents

### Note:

- Primary energy is that contained in energy products extracted from the natural environment. This energy is used as-is by the end user, or processed into another form of energy (e.g. electricity), or consumed in the transformation process or during transit to the user, or used for non-energy purposes. Primary energy is recorded as early as possible upstream. Primary energy production is calculated by multiplying the quantities by the heating value.
- Total final energy consumption is the quantity of energy available for the end user. It is the primary energy consumption minus the internal consumption of the energy branch.
- Primary energy production in KTOE (thousands of tonnes of oil equivalents) for all renewable energies is equal to the total primary renewable electrical and thermal energies:
  - renewable electrical energies: renewable hydraulic wind and photovoltaic energy production.
  - renewable thermal energies: thermal solar, geothermal, heat pumps, biomass (fuelwood, renewable incinerated urban waste, agricultural and agrifood residue, biogas, biofuel).
- Final consumption of all renewable energies in KTOE for the RE Directive (2009/28/EC) is equal to:
  - standardized (to eliminate meteorological variations) renewable electrical production: standardized gross hydraulic and wind energy production, gross photovoltaic and electrical energy production from biomass;
  - final renewable thermal energy consumption according to the RE Directive: final real consumption relative to thermal solar, geothermal, heat pumps in compliance with the Directive, biomass (incinerated urban waste, fuelwood, agricultural and agrifood residue, biogas);
  - biofuel consumption.
- Data in the table on p.152 are from SOEs, while those on the table on p.153 are from SSP. The differences between these data could be explained by differences in the methods used.

France is rich in renewable energy resources. In 2009, it was the second-ranking producer and also the second-ranking consumer of renewable energy in Europe (SOEs). Primary production of all renewable energies (electrical and thermal) was 20 MTOE (millions of tonnes of oil equivalents), or 15.3% of the total national energy production.

Since 2007 and the Grenelle Environment Forum, France has been developing and implementing an ambitious renewable energy development strategy throughout the country. Renewable energy production, according to the Grenelle Environment, is one of the two key energy strategies, with the second being to enhance energy efficiency in buildings.

A French national renewable energy action plan was drawn up in application of the European RE Directive 2009/28/EC and submitted to the European Commission in mid-2010. It outlines the contributions of each form of renewable energy and charts a tentative annual course for the 2010-2020 period for each form, so as to be able to reach, by 2020, the objective set by this directive of 23% renewable energy in the total final energy consumption.

Energy generated from biomass for heat and electricity production must be substantially developed in the coming years. In addition to small-scale facilities to generate heat for residences, biomass can also provide fuel for heating systems

and electrical energy or cogeneration plants. In 2006, heat production by the biomass sector was 8.8 MTOE (excluding biogas). The heat production objectives for 2012 and 2020 are 12.2 and 19.7 MTOE, respectively.

The Grenelle Environment Forum set the objective to produce a supplementary 21 Mm<sup>3</sup> of wood by 2020, more than half of which is targeted for energy production. In 2008, ADEME (Agence de l'environnement et de la maîtrise de l'énergie) therefore assigned the French National Forest Inventory (NFI) the task of conducting a national assessment of woody biomass that should be available for energy production by 2020 (NFI, 2010). On the basis of an innovative assessment method and the most recent resource data, the study evaluated the mobilizable supplement in the light of the actual silvicultural, technical, economic and environmental situation. The sustainable supplementary stock of wood available for energy production in forests, poplar plantations and hedges was thus estimated at 12 Mm<sup>3</sup>/year (2.7 MTOE), plus 7.2 Mm<sup>3</sup>/year of other minor forest wood products (1.6 MTOE). A major management effort will nevertheless be required to rehabilitate currently abandoned stands so as to be able to mobilize these volumes.

## Indicator 6.10

Area of forest and other wooded land where public has a right of access for recreational purposes and indication of intensity of use

### ■ Total per-capita forest area

#### ISFM 2005 Edition

	1993	1998	2003
Population (x1,000 inhabitants)	57 369	58 299	60 102
Forest area, including poplar plantations (1,000 ha)	14 811	15 220	15 408
Per-capita forest area (ha)	0.26	0.26	0.26

Sources: Service central des enquêtes et études statistiques (SCEES, now Service de la statistique et de la prospective (SSP)) /Enquête annuelle sur l'utilisation du territoire (Teruti) (1993 to 2003); Institut national de la statistique et des études économiques (INSEE)/General population census, estimations on 1<sup>st</sup> January of the year.

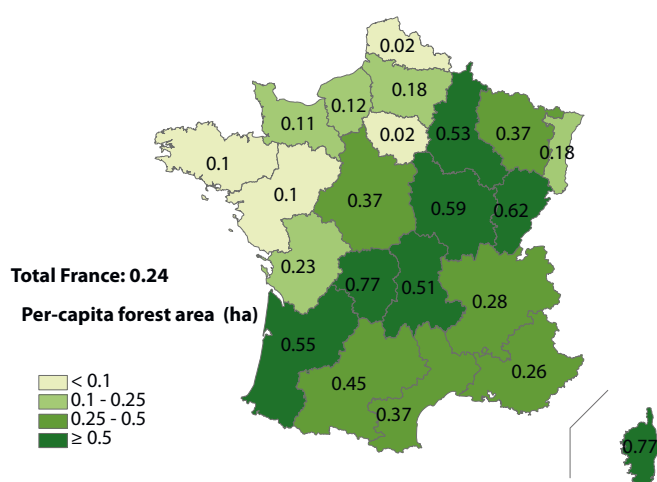
#### ISFM 2010 Edition

2010	
Population (x1,000 inhabitants)	62 135
Forest area, including poplar plantations (x1,000 ha)	15 137
Per-capita forest area (ha)	0.24

Sources: SSP - Teruti-Lucas (2010). Institut national de la statistique et des études économiques (INSEE) (2008 census, cumulation of data collected in the five census surveys from 2006 to 2010).

The per-capita forest area is 0.24 ha on average in France. The situation varies in different French regions because of differences in percentage forest cover and population densities. Corsica and Limousin have the highest per-capita forest area (0.77). The lowest ratios occur in Île-de-France and Nord-Pas-de-Calais (0.02).

This first approach to the 'forest supply' should be improved by including a property parameter since there is no public access to some private forests. Moreover, the distance between the population and the closest forest is a key factor with respect to accessibility. Forest access is also to an increasing extent governed by different, and sometimes competing, forest uses, especially on week-ends (hunting, hiking, etc.): a rigorous spatiotemporal understanding of activity sharing in forests could enhance the concept of public access to forests.



Map 26: Per-capita forest area by region.

Source: Institut national de la statistique et des études économiques (INSEE) (2008 census, cumulation of data collected in the five census surveys from 2006 to 2010) and SSP - Teruti-Lucas 2010 (forest area including poplar plantations and excluding other wooded land).

Note: Because of the switch from the Teruti survey to the Teruti-Lucas survey, it is impossible to make direct comparisons between the survey data (cf. Indicator 1.1). The decline in forest area between the 2003 and 2010 surveys is due to the sampling change. The data apply to metropolitan France.

## Public forests

		Forest area devoted mainly to public access in ha (proportion of wooded area)			
		1994	1999	2004	2009
State-owned forests	Area	19 500	30 000	27 000	25 000
	<i>proportion of wooded area</i>	17 300	26 700	24 000	23 000
Other public forests governed by forest regulations	Area	24 000	33 500	35 000	44 000
	<i>proportion of wooded area</i>	19 900	27 800	29 000	36 000
<b>Total public forest</b>	Area	<b>43 500</b>	<b>63 500</b>	<b>62 000</b>	<b>69 000</b>
	<i>proportion of wooded area</i>	<b>37 200</b>	<b>54 500</b>	<b>53 000</b>	<b>59 000</b>

Source: Office national des forêts (ONF), management plan datasets on public access. Areas include wooded and non-wooded lands.

Note: The National Estate of Chambord is counted with forests owned by public authorities. The public access datasets concern parts of forests with priority public access. However, their area is only a partial indicator of the extent of public use of public forests. Most of these forests are open to the public and many public forests managed chiefly for wood supply have a high level of public facilities. As of 1 January 2010, and in compliance with the new ONF Directives nationales d'aménagement et de gestion, the public access dataset concept has been dropped and new public forest development plans will specify the classifications of forests (or parts of forests) according to the social demand (low, average, high). This classification will be developed on the basis of the extent of public use and in the light of regulations concerning landscape (e.g. classified site), public hosting or cultural facilities (e.g. forest charter focused especially on social and cultural aspects). The new database on public facilities will enable monitoring of areas by social demand class (integration of state-owned forests in 2011 and other public forests governed by forest regulations as the public facilities are upgraded).

For all public forests combined, the area in the public access datasets has increased considerably over the last 15 years, reflecting the fact that the social demand is being taken into consideration to an increasing extent in development projects. These stands, which are mainly located in the vicinity of large towns or famous tourist sites, benefit from specific equipment and tailored management, which is aimed at reconciling the high public use of certain sites with stand rehabilitation and preservation of ecologically sensitive environments.

The ONF has installed a considerable amount of equipment to meet the recreational demand in state-owned forests, especially (ONF, 2008):

- 15,600 km of hiking trails
- 7,200 km of cycling trails
- 3,200 km of horseback riding trails
- 1,100 km of cross-country ski trails
- 1,980 equipped reception areas
- 49 campgrounds
- 20 hiking trails with reception areas specially equipped for disabled persons.

Social expectations of French people concerning the forest area are complex and ever-changing. This situation prompted ONF, in partnership with scientific organizations, to undertake a large-scale assessment on social demand relative to forests. This work is aimed at clearly identifying and analysing expectations so that forest management can ultimately be tailored to meet these needs. A preliminary assessment, carried out in partnership with the Institut de recherche pour l'ingénierie de l'agriculture et de l'environnement (CEMAGREF, Bordeaux), showed that public expectations extended far beyond the recreational aspect of forests and could not be solely fulfilled by installing equipment associated with public accommodation. In 2004, a national survey on different images of forests in the public eye, conducted by ONF and the Université de Caen, concluded that the forest's role as a "heritage to pass on to future generations" is the top concern of French people (87%).

## Public use of private forests of over 1 ha

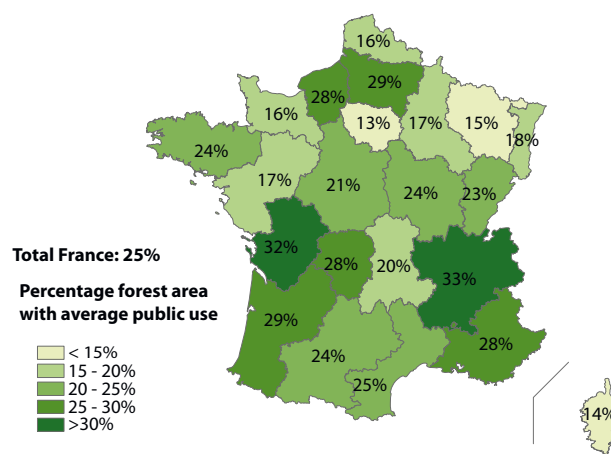
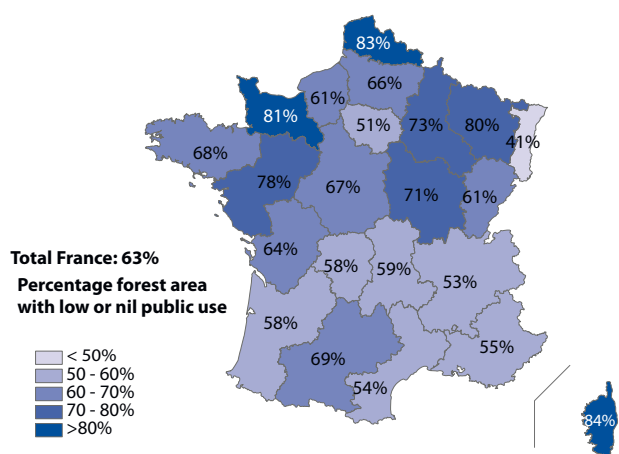
### Public use of private forests of over 1 ha

	Number of owners (1,000)	Forest area (1,000 ha)
<b>Total</b>	<b>1 118</b>	<b>9 848</b>
<i>including %</i>		
providing free public access to their forests	86%	72%
where the forest is visited by the public	75%	84%
- low public use	51%	46%
- medium public use	19%	25%
- high to very high public use	5%	12%
considering that the public causes no annoyance	87%	67%
tolerating picking of small products	88%	78%

Source: Service central des enquêtes et études statistiques (SCEES, now Service de la statistique et de la prospective (SSP), 1999, survey on private forest property structures; only forests of over 1 ha were monitored.

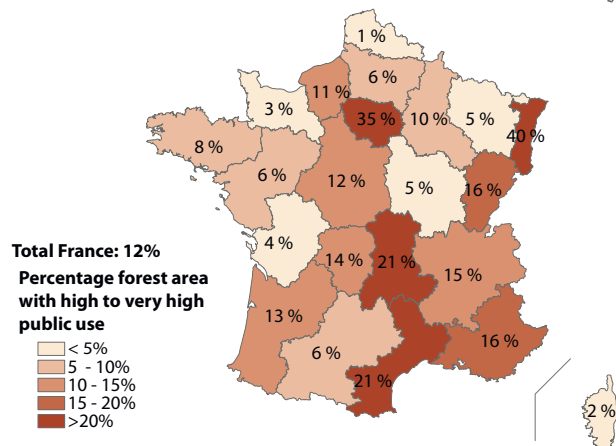
According to the 1999 SCEES survey, most owners of private forests of over 1 ha (86%) declare that they provide free access to their forests, i.e. 72% of the total forest area. Prohibited access is usually enforced by legal bodies, as displayed by warning signs (21% of areas) or by physical barriers (7%). A very large proportion of private forests is actually used by the public (84%) but the visiting rate is only high to very high in 12% of the area and limited to 5% of

owners. The results vary from region to region (Map 27): the most visited private forests are located around large urban centres (Île-de-France) or in regions where tourism is high (Alsace, Languedoc-Roussillon, Auvergne, Provence-Alpes-Côte d'Azur). Finally, according to the same survey, many private owners consider that the public does not cause any annoyance and they tolerate picking of mushrooms, berries and other small products in their forests.



Map 27: Private forest areas with high to very high, average and low or nil public use per administrative region.

Source: Service central des enquêtes et études statistiques (SCEES), now Service de la statistique et de la prospective (SSP), 1999



## ■ Number of visits in forests

### Total number of visits in forests

Public activities	Total number of household visits	Mean number of visitors per household	Total number of individual visits	Proportion of visits of 2 h and more	Number of visits per person and per year
2001	1,000,000	units	1,000,000	%	unit/pers./year
Walking	287	2.5	716	72%	12.5
Sports	51	2.1	109	65%	1.9
Animal walking	44	1.6	69	30%	1.2
Picking	21	2.5	51	88%	0.9
Hunting	10	1.7	18	74%	0.3
Fauna/flora	9	1.5	14	82%	0.2
Firewood	7	1.4	10	83%	0.2
Other activities	12	1.9	23	99%	0.4
<b>Total</b>	<b>441</b>	<b>2.3</b>	<b>1 010</b>	<b>70%</b>	<b>17.7</b>

Source: Survey of the Laboratoire d'économie forestière (LEF).

According to a LEF study conducted in 2002 in a sample of 2,575 French households representative of telephone subscribers, and concerning the year 2001, 56% of French households had visited a forest at least once in 2001. There was a total of 441 million visits, two-thirds of which involved walks. Each household was composed of 2.3 members on average, which means there was a total of a billion visits by French people in 2001. Walking is most often associated with picking, usually in family groups, more than nature

watching, rural activities (hunting, firewood collecting) or walking a dog. Excluding the time it takes to reach the forest (mainly by car, bicycle or on foot), the visiting time is often over 2 h, and 2.5 h on average. Recreational activities in the forest are thus extremely important for French people, who pay around €2 billion per year just to gain access to forests by car.

### Frequency of visits

Frequency of visits in forests during the 12 last months	% 1995	% 2004
Every day or almost		3
Once a week		12
<b>Subtotal: at least once a week (2004)/very often (1995)</b>	<b>22</b>	<b>15</b>
Once every 2 weeks		11
Once a month		16
<b>Subtotal: at least once a month (2004)/often (1995)</b>	<b>33</b>	<b>42</b>
Several times a year (2004)/rarely (1995)	26	29
<b>Subtotal: at least once a year</b>	<b>81</b>	<b>71</b>
Never	19	29

Sources:

2004: 'Forests and society' survey of the Office national des forêts (ONF)–Université de Caen/Laboratoire d'analyse secondaire et de méthodes appliquées à la sociologie (LASMAS), 2004.

1995: Survey of the Institut français de l'Environnement (IFEN, now the Service de l'observation et des statistiques (SOeS))/former Directorate of Rural Areas and Forest of the French Ministry of Agriculture/Centre de recherche pour l'étude et l'observation des conditions de vie (CRÉDOC).

According to the 2004 'Forests and society' survey (ONF–Université de Caen/LASMAS), French forests receive around 35 million visitors a year, for a total of 500 million visits, and 71% of French people visited a forest at least once. There seems to have been a slight decrease in forest visits between 1995 and 2004: in 1995, 19% of French people never visited forests (IFEN/DERF/CRÉDOC, 1996), whereas this rate increased to 29% in 2004. When comparing forest visits to common French cultural practices such as going to the movies (52% of the population had gone to the movies at least once over a 1 year period – INSEE, 2002), visiting forests still seems to be one of the most widespread recreational activities (ONF, 2005).

### Duration of forest visits

Last time you visited a forest, you stayed...	%
All day	8
Half a day	33
Around 2 h	42
Less than 2 h	17

Source: Office national des forêts (ONF)/Université de Caen 'Forests and society' survey, 2010.

The 2004 survey is currently being renewed. Initial results of the 2010 survey (ONF/Université de Caen 'Forests and society' survey, 2010) nevertheless confirmed the increase between 2004 and 2010 in the percentage of people who had not visited a forest in the year. In 2010, forest outings did not last more than half a day in 92% of cases. The most common way of visiting the forest is in a car, but a third of the people interviewed stated that they visited forests without any vehicle. Forest visits are, to an increasing extent, a privileged time for having fun with the family or friends. Only 14% were alone when last visiting a forest.

### Means of transport to get to the forest

Last time you visited a forest, you went...	%
By car	61
On foot	31
By bicycle	4
Other	4

Source: Office national des forêts (ONF)/Université de Caen 'Forests and society' survey, 2010.

## Indicator 6.10.1

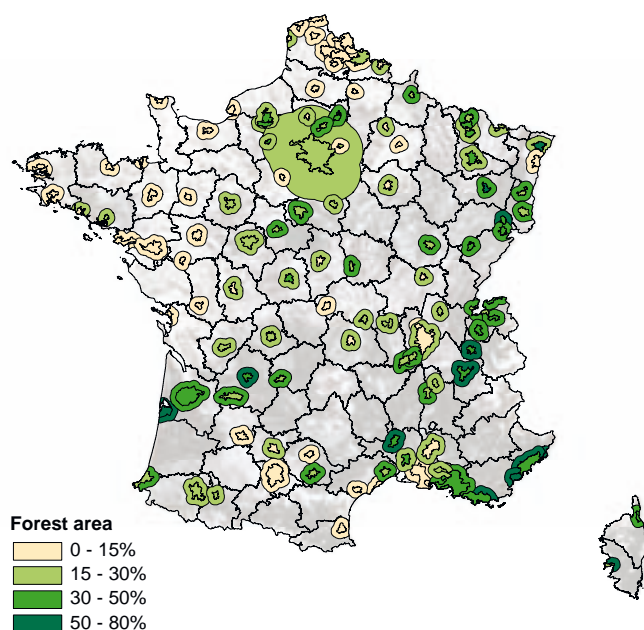
### Forests under urban influence

#### Area of forests under urban influence and per-capita forest area

	Urban unit	Extended area
Number	114	
Forest area (in ha)	606 000	3 110 000
Mean afforestation rate	21.7%	25.2%
Number of inhabitants	32.4 millions	
Forest area/inhabitant (m <sup>2</sup> /ha)	187	958

Source: French National Forest Inventory (NFI) forest cartographic database for the forest area (latest version available in 2011 for each department) and the Institut national de la statistique et des études économiques (INSEE) for the number of inhabitants (2008 census and the 1999 delineation of urban unit boundaries).

Note: forests under urban influence (NFI, 2006) are defined on the basis of the NFI forest cartographic database combined with the municipal boundaries of urban units of over 50,000 inhabitants and their extended area (10 km beyond the municipal boundaries of the urban unit, 50 km for Paris). The NFI forest cartographic database, based on aerial photographs, contains all wooded areas (zones with over 10% forest tree cover at the time of the photograph, or which could reach this threshold) of over 2.25 ha and over 75 m wide. For INSEE, an urban unit is a municipality or a set of municipalities that includes, within its area, a built-up zone with at least 2,000 inhabitants and where no dwelling is separated from the nearest neighbour's dwelling by more than 200 m. Moreover, over half of the inhabitants of each concerned municipality must live in this built-up zone.



Map 28: Forests under urban influence.

Source: French National Forest Inventory (NFI) forest cartographic database for the forest area (latest version available in 2011 for each department) and the Institut national de la statistique et des études économiques (INSEE) for the number of inhabitants (2008 census and the 1999 delineation of urban unit boundaries).

A fifth of the forest area in France is 'under urban influence', including 606,000 ha in 114 urban units of over 50,000 inhabitants and 3,110,000 ha in the extended areas of these units. These forest areas may be used by urban inhabitants for recreational purposes.

The urban unit of Paris and its extended area covers a total area of 2.4 Mha with 524,000 ha of forest, including large state-owned forests (e.g. Rambouillet, Fontainebleau, Compiègne).

The forest area within the 114 urban units with over 50,000 inhabitants is 22% on average. It is slightly lower than that of the extended areas (25%). However, the mean values mask marked differences. Around a third of urban units and their extended areas (41 urban units) have a forest area of under 15%. These are mostly located in regions without much woodland: northern tip, northwest (from Havre to La Rochelle), the western Mediterranean coastal region, central part of the Midi-Pyrénées region (Toulouse, Agen, Albi). This is also the case for a few urban centres such as Strasbourg, Châlons-en-Champagne and Montluçon. In contrast, around a third of urban units and their extended areas (39 urban units) have a forest area of 30% or more. These are located in areas with a substantial forest area: Alps, Vosges, Jura, Aquitaine and the eastern Mediterranean region.

With 32.4 million inhabitants, the 114 urban units of over 50,000 ha pool over half of the French population. Within each urban unit, this population has access to 187 m<sup>2</sup>/inhabitant of forest on average. This average masks contrasting situations. 29% of the urban units (33) have a per-capita forest area of less than 100 m<sup>2</sup>. This could be explained by the low afforestation rate (under 15%), except for Paris which has a higher rate, but also a high population density. Conversely, the inhabitants of seven urban units have access to over 1,000 m<sup>2</sup> (Alès, Arcachon, Elbeuf, Épinal, Fréjus, Haguenau, Périgueux). Urban units with the highest populations generally have a lower per-capita forest area.

Indicator 6.11

Number of sites within forest and other wooded land designated as having cultural or spiritual value

Type of site	Number	Observations	Source
Classified sites with wooded areas	275	with 6 sites labelled 'Grand Site de France' including forest: Sainte-Victoire (2004); Pont du Gard (2004); Bibracte – Mont Beuvray (2007); Puy de Dôme (2008); Marais Poitevin (2010); Saint-Guilhem-le-Désert - Gorges de l'Hérault (2010)	1
Arboretums in public forests	144	with 15 of national interest	2
Forest biosphere reserves	6	Vallée du Fango (1977), Cévennes (1985), Vosges du Nord (1988), Mont Ventoux (1990), Lubéron (1997), Pays de Fontainebleau (1998)	3
World Heritage sites	3	Réserve naturelle de Scandola en Corse (maquis) (1983) Pyrénées - Mont Perdu (1997) Vallée de la Loire (Domaine de Chambord) (2000)	3
Unusual trees and tree groups in public forests	2 100	with 290 of national interest	4
Unusual stands and tree rows in public forests	280		4
Periurban protection forests	14	Bois d'Epinoy (1984), Bois des Dames (1984), Bois d'Holnon (1987), Massifs de St-Avoid et de la Houve (1989), Forêts de St-Aubin-de-Médoc et le Taillan-Médoc (1991), Massif du Rouvray (1993), Forêt de Sénart (1995), Forêt de Fontainebleau (2002), Forêt de Dreux (2004), Forêt de Nonnenbruch (2004), Forêt d'Evreux (2007), Forêt de Fausses-Reposes (2007), Forêt de Rambouillet (2009), Forêt de Bouconne (2009).	5

Source: 1 French Ministry of Ecology, Sustainable Development, Transportation and Housing (MEDDTL).

2 Office national des forêts (ONF).

3 United Nations Educational, Scientific and Cultural Organization (UNESCO) 2010.

4 Office national des forêts (ONF) 2008, based on the 'Arbres remarquables' database.

5 French Ministry of Agriculture, Food, Fisheries, Rural Affairs and Spatial Planning (MAAPRAT)

Note: some sites, already mentioned in Indicator 4.9, can also have a cultural or spiritual value.

The forest has an important cultural and symbolic status in the French imagination. This is reflected in the main images that the forest brings to mind for people, as a "heritage to pass down to future generations" and a "nature reservoir", as revealed in a survey undertaken by the ONF and the Université de Caen in 2004 (ONF, 2006). Forest areas with a high cultural and symbolic value include sites that are classified as being partially wooded, arboretums with public access, biosphere reserves, World Heritage sites, unusual trees and tree stands and periurban protection forests.

**Classified sites** are legally designated as sites whose conservation or preservation is of public interest from an artistic, historical, scientific, legendary or scenic standpoint. Some sites come under several criteria. All forestry work that could modify the state or aspect of a classified site requires an authorisation from the minister responsible for these sites. Around 275 sites are classified as being partially wooded, representing a total area of 74,000 ha (figures from the Environment Ministry 2004). Two-thirds of them

are classified with respect to all of the criteria mentioned above, with 20% considered as being 'scenic'. Most of them are located in Île-de-France (21%), Bretagne (13%), Pays-de-la-Loire (12%), the Centre region (11%) and Provence-Alpes-Côte d'Azur (8%). The most famous and used classified sites—'Major sites'—benefit from special policies aimed at restoring sites that are highly visited and at developing projects to enable long-term management. The two main tools proposed by the State to achieve these objectives are the 'Opérations Grands Sites' and the Grand Site de France® label. The Opérations Grands Sites are initiatives geared towards addressing problems encountered in hosting visitors and in maintaining the sites, and they give rise to a study programme and work operations implemented by the site manager. Eight sites have been granted the Grand Site de France® label since 2004, six of which include a forest area: Sainte-Victoire, Pont du Gard, Bibracte – Mont Beuvray, Puy de Dôme, Marais Poitevin and Saint-Guilhem-le-Désert - Gorges de l'Hérault.



French **arboretums** are relatively untapped biological heritage resources. They contain very high diversity (taxa and individual plants), rare species (endangered, vulnerable or symbolic) and very unique ecosystems. 144 of these arboretums are located in public forests and managed by ONF. Their size, origin and design varies, so they present different features. An analysis of all arboretums was carried out in 2006-2007. They have been rated on the basis of three criteria, which are considered to be essential in the identification of sites of national interest:

- conservation interest (containing at least 10 wild species that are on the Red Lists of the International Union for Conservation of Nature (IUCN), species that are rare or endangered, with each being represented by at least 10 individuals);
- scientific interest (the presence, with a population of a minimum of 10 individuals, of at least one known native species that is represented in at least one other arboretum and whose traits, with respect to future climate change, are considered interesting);
- heritage interest: an interest associated with the variety of the collection, the history, the presence of unusual individuals or a landscape attraction.

In state-owned forests, this assessment led to the identification of 15 arboretums that could be considered of national interest, thus warranting a special management policy.

UNESCO launched a scientific programme entitled Man and the Biosphere (MAB) in 1971, with the aim of gaining further insight into the relationship between man and the environment. Within the framework of this programme, UNESCO developed the '**biosphere reserve**' concept-sites where natural resource-friendly human developments are showcased and applied. In 2011, there are 564 biosphere reserves worldwide, located in 109 countries. France has 10 reserves, 7 of which are in metropolitan France. Six of these metropolitan reserves are forested, i.e. the biosphere reserves of Pays de Fontainebleau, Vosges du Nord, Cévennes, Mont Ventoux, Luberon and Vallée du Fango in Corsica.

The UNESCO World Heritage Convention was adopted in 1972. Its aim is to globally promote the identification, protection and preservation of cultural and natural heritage considered as having an outstanding value for humanity.

**Natural heritage sites** have an outstanding universal value from scientific, conservation or natural beauty standpoints. There are 35 World Heritage sites in France, 3 of which are in metropolitan France and include forests or maquis ('other wooded lands' according to the Food and Agriculture Organization of the United Nations (FAO)). These are the 'Val de Loire between Sully-sur-Loire and Chalonnes' site, including the Domaine de Chambord (classified since 1981, it was included in the Val de Loire site in 2000); the 'Golfe de Porto: calanche de Piana, golfe de Girolata, réserve de Scandola' site which includes the Scandola nature reserve in Corsica, a remarkable example of Mediterranean maquis; and the 'Pyrénées - Mont Perdu' site which includes forest.

In 1996, the ONF undertook an inventory of **unusual trees** in public forests. They were defined according to dendrological (size, age), aesthetic (stem shape, foliage, roots) or cultural (historical, religious, ethnographic value) criteria. These trees are generally not legally protected but they are taken into

account in forest management plans. ONF thus conducted local inventories with regional and national harmonization and four interest levels. Around 2,100 trees and tree groups were classified as unusual, 290 of which were considered as being of national interest. In addition, 280 unusual stands and tree rows were recorded.

The protection forest classification is the oldest forest protection tool. This status was created in 1922 with the aim of preserving mountain lands and providing protection against natural hazards. In 1976, it was expanded through a nature protection law to include **periurban forests** and forests requiring preservation for ecological reasons or for the well-being of the population. The protection forest classification, which is the most legally binding forest protection tool, is reserved for massifs of major environmental and social importance. There are currently 14 periurban protection forests. The classification restricts property rights: all forest clearing operations are prohibited, as well as any infrastructure building. It also enables public traffic and motor vehicle control.