

Chapter 10

Biomass for energy and plantations – new certification driver: Certified forest products markets, 2006-2007¹

Highlights

- The area of certified forest grew by 8.3% from 2006 to 2007, reaching 292 million hectares, which is 7.6% of the global forest area; however, the rate of increase is slowing.
- More than 84% of the world's certified forest is located in the northern hemisphere, with more than half (56%) in North America and another 28% in Europe; however, their shares are decreasing with an expected boom in Russia and China.
- The global push to reduce carbon emissions and to produce more forest-based biofuels means woodfuels have to be considered in terms of their sustainable production, which could mean their certification.
- The introduction of new certified species from plantations, such as hybrid poplar, into the solid wood and biomass market sectors is expected to rapidly increase both the volume of certified supply and market demand.
- Half of the world's certified forest area is in plantations, mixed plantations and semi-natural forests, all of which are necessary for forest products.
- Forest certification helps to accelerate access to international voluntary carbon markets, where regional climate registries acknowledge qualified certification systems as a baseline for forest-based offset verification.
- Certification of the same forests and products by multiple schemes is a trend originating from the desire of industry and consumers for mutual recognition by the major certification schemes.
- Paper purchasers are driving increased demand for certified wood, with impacts felt across major geographic regions and pulp and paper distribution channels.
- Due to low consumer awareness, and therefore demand, as well as the lack of incentive for the producer, the majority of certified forest products are marketed without any reference to certification.
- Non-wood forest-products are being certified for sustainable production, including cork, essential oils, chestnuts, honey, berries, truffles and mushrooms.

¹ By Mr. Florian Kraxner, International Institute for Applied Systems Analysis, Dr. Catherine Mater, Mater Engineering, and Dr. Toshiaki Owari, University of Tokyo.

Secretariat introduction

This chapter provides an update on certified forest products (CFPs) and the certification of forests for sustainable forest management. The mandate to analyse and report on developments comes from the UNECE Timber Committee and the FAO European Forestry Commission. When certification of forest management began in 1995, the Committee and the Commission established a Team of Specialists to predict how certification would affect the forest sector. It was an overly challenging task at that time, but the Team produced various scenarios. As certification grew, the Committee and the Commission established an officially nominated Network of Country Correspondents on Certification and Certified Forest Products Markets. The authors of this chapter did not survey the entire network, but rather obtained information for some key markets from some correspondents in the network, as well as from other key players in the market. There are currently no official statistics for trade in CFPs, as confirmed by the FAO/UNECE Working Party on Forest Economics and Statistics in May 2006, reflecting the fact that CFPs do not feature in the Harmonized Commodity Description and Coding System (HS) maintained by the World Customs Organization. Nevertheless, there are alternative sources of information. Unless otherwise attributed, all estimates and opinions in this chapter are from the authors' interpretations.

This chapter will provide a basis for an exchange of ideas on CFP markets at the joint Timber Committee and International Softwood Conference Market Discussions on 8-9 October 2007. Following last year's market discussions, a policy forum was held on "Public procurement policies for wood and paper products and their impacts on sustainable forest management and timber markets"². Some government procurement policies and some company procurement policies require certified wood products as evidence of sustainability and legality. The forum examined the complexity of new public procurement policies in Europe, and new green building policies in North America, e.g. how to assess different certification schemes and how to avoid creating trade barriers. Public procurement and green building policies are strong drivers for CFPs.

It is a pleasure to thank once again Mr. Florian Kraxner,³ expert in CFPs, International Institute for Applied Systems Analysis, Laxenburg, Austria, who led the production and wrote most of this chapter. Mr.

Kraxner is a member of the UNECE/FAO Team of Specialists on Forest Products Markets and Marketing, and presented CFP markets at the last Timber Committee Market Discussions. Dr. Catherine Mater,⁴ President, Mater Engineering, Ltd. and Senior Fellow, The Pinchot Institute, Corvallis, Oregon, US, contributed especially to the North American analysis. We thank once again Dr. Toshiaki Owari,⁵ University of Tokyo, for his perspective on Asian CFP markets.

10.1 Introduction

The UNECE region's CFP markets have been analysed in a chapter of the UNECE/FAO *Forest Products Annual Market Review* since 1998. This year's chapter provides an in-depth statistical overview of the market and trade of CFPs and also concentrates on policy-related aspects of certification in the forest sector. CFPs bear labels demonstrating, in a manner verifiable by independent bodies, that they come from forests that meet standards for sustainable forest management (SFM). Consumers might find labels on furniture and wood products, while manufacturers can verify the sources through the certification scheme's chain-of-custody (CoC) procedures. Non-independently (third-party) certified forests such as the Malaysian Timber Certification Council⁶ (MTCC) or the Indonesian Ecolabelling Institute⁷ (LEI), and their CFPs, are not included in this analysis, although their certified products are imported into the UNECE region. Process certification schemes such as ISO⁸ 14001 are not included in this comparative analysis. The chapter focuses on certification systems based in the UNECE region.

² Proceedings at: www.fao.org/docrep/009/a0914e/a0914e00.htm

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⁶ <http://www.mtcc.com.my/>

⁷ <http://www.lei.or.id/english/index.php>

⁸ <http://www.iso.org>

This year's chapter contains:

- 10.2 Supply of CFPs
- 10.3 Demand for CFPs
- 10.4 Policy issues
- 10.4.1 Public procurement and governance in North America
- 10.4.2 Sustainable forest management and illegal logging
- 10.4.3 Certification in the Russian Federation
- 10.4.4 Developments in the Japanese and Chinese markets for CFPs
- 10.4.5 Biomass for bioenergy – biofuel potential and its certification
- 10.4.6 Certification and forest plantations
- 10.4.7 Non-wood forest product certification
- 10.5 References.

10.2 Supply of CFPs

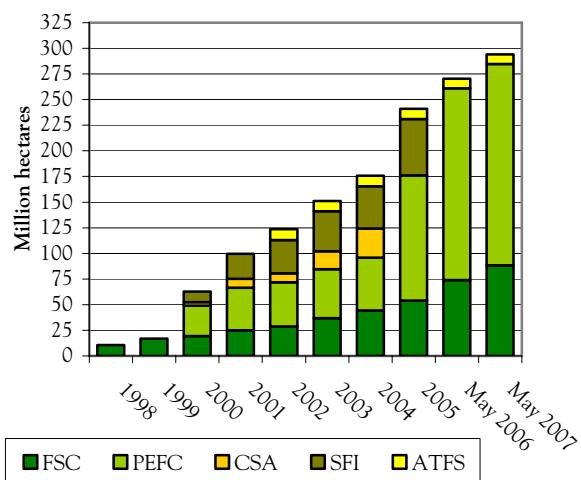
By May 2007, the area of certified forest worldwide totalled 294 million ha, approximately 7.6% of the world's forests (3.9 billion ha (FAO, 2007)), a relatively steep and constant increase since the first third-party certification of forest area took place in 1993 by the Forest Stewardship Council (FSC). However, compared with some of the previous survey periods (e.g. May 2004 to May 2005), the annual rate of increase in certified area has fallen by more than half to some 12% during the period May 2005 – May 2006 and to only 8.3% during the period May 2006 to May 2007. Approximately 1.5 million ha in Europe (mostly Sweden) and another 0.8 million ha in North America (mostly Canada) are double certified by two different systems (graph 10.2.1).

“Double certification” or “dual certification”, i.e. the certification by two or multiple third-party schemes at the same time for the same forests and the same products, is a new trend in forest and CoC certification. This tendency originates from the desire for mutual recognition by the major certification schemes, strongly requested by forest industry and consumers alike. Nevertheless, full or partial recognition between FSC and the Programme for the Endorsement of Forest Certification schemes (PEFC) is not feasible in the near future due to controversies between them. Full mutual recognition exists e.g. between the Sustainable Forestry Initiative (SFI) (PEFC-umbrella) and the American Tree Farm System (ATFS). Consequently, under the SFI system, ATFS-certified (raw) material is considered equivalent to SFI-certified material and vice versa (figure 10.2.1).

GRAPH 10.2.1

Forest area certified by major certification schemes,

1998-2007



Notes: As of May 2007, approximately 2.3 million hectares have been certified by more than one scheme. These are not deducted from any scheme. The graph therefore shows a slightly higher amount of total forest area certified than exists in reality. FSC=Forest Stewardship Council; PEFC=Programme for the Endorsement of Forest Certification schemes; CSA=Canadian Standards Association Sustainable Forest Management Program (endorsed by PEFC in 2005); SFI=Sustainable Forestry Initiative (endorsed by PEFC in 2005); ATFS=American Tree Farm System.

Sources: Individual certification systems and the Canadian Sustainable Forestry Certification Coalition, 2006.

Figure 10.2.1.

Examples of certification logos based in the UNECE region



Source: Nordic Family Forestry, 2007.

Since 2000, the certified forest area has increased every year, mainly due to certification by:

- ATFS.
- Canadian Standards Association Sustainable Forest Management Program (CSA, endorsed by PEFC in 2005).
- Forest Stewardship Council (FSC).
- PEFC, formerly known as the Pan European Forest Certification System.
- SFI, endorsed by PEFC in 2005, in the US and Canada.

PEFC endorsed the two biggest certification schemes in North America – the CSA system of Canada at the beginning of 2005, as well as SFI by the end of 2005. Allowing CSA to bear the PEFC label means including another 73 million ha (May 2007) and a further 54.4 million ha – in the case of SFI – under the PEFC umbrella, which now totals 196.3 million ha of certified forest area worldwide. In North America, the forest area certified under the PEFC umbrella has grown as a result of a 5.4% increment of the CSA scheme, whereas there was no increase of SFI certified area during the last 12 months until May 2007. Worldwide, the PEFC umbrella performed an increment rate of 5.2%, or 10.2 million ha in absolute figures, during this survey period (May 2006 to May 2007). PEFC managed to keep the same increase in absolute numbers of additionally certified ha (not by endorsement of other existing schemes and their ha), as during the previous survey period.

Additionally, 10 forest certification systems are currently undergoing the PEFC endorsement process. Lithuania and the US (ATFS) have submitted their systems for endorsement. Latvia and Switzerland have submitted their systems for re-endorsement. For the endorsement assessment, the national certification systems for Estonia, Gabon, Italy, Poland, Slovenia and the United Kingdom have been going through a public consultation process and will consequently be endorsed by the PEFC Board of Directors and a vote by the PEFC members on endorsement or otherwise.

FSC listed a total of 88.4 million ha in May 2007, an increase of more than 14.5 million ha, or 16.4%, during the last 12 months. FSC's increment rate slowed down by more than half during this period compared with the survey period May 2005-May 2006.

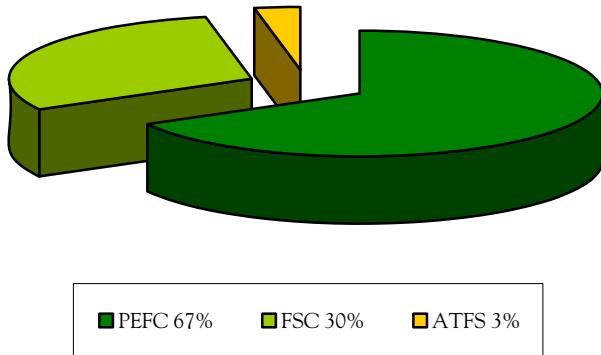
The third major system of North America is ATFS, which has remained relatively stable throughout the last five survey periods. After a slight drawback during the survey period, the smallest third-party certification scheme in North America could grow again, totalling slightly more than 9.3 million ha in the US only. ATFS is currently undergoing an endorsement process with PEFC

and might join the umbrella within this year. Officially, the ATFS and SFI labels are already mutually recognized, which allows for fast endorsement negotiations with PEFC.

In terms of share of certified forest area, the market is clearly divided (graph 10.2.2). Due to the endorsement of SFI and CSA by PEFC, the portfolio of major certification schemes has been reduced to 3 systems only. The PEFC umbrella accounts for slightly more than two thirds of the area certified globally. With a share of 30%, FSC is the second largest scheme and ATFS currently still holds 3% of the certified area worldwide. Due to a higher increase by FSC (plus some 2%), the PEFC umbrella lost about 3% (of its relative share in the total) during the present survey period (May 2006-May 2007). This loss might be compensated soon by the endorsement of ATFS, anticipated in 2007.

GRAPH 10.2.2

Share of certified forest area by the three major schemes, 2007



Notes: If a forest has been certified to more than one standard, the respective area has been counted in each of the certifying schemes involved. The total of certified forest area in this graph therefore shows a higher amount, approximately 1.5 million hectares more, than exists in reality. As of May 2007.

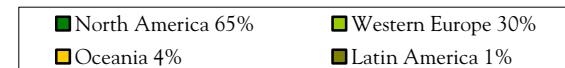
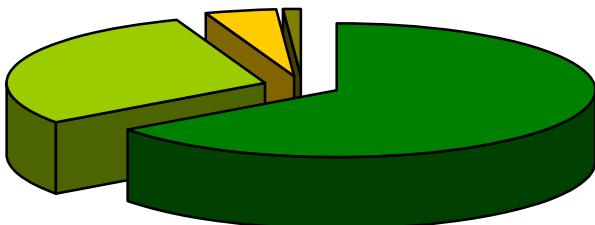
Sources: Individual certification systems, Forest Certification Watch and the Canadian Sustainable Forestry Certification Coalition, 2007.

Relatively unchanged from the last survey period, most of the PEFC-certified forest area lies in the northern hemisphere, i.e. non-tropical (boreal and temperate) zones, with more than two thirds of it outside Europe (graph 10.2.3). The majority of this certified area (65%) is in North America. Approximately one third is located in the EU and other countries of western Europe (European Free Trade Association (EFTA)). There is still no forest area certified by PEFC in Russia. The share in the tropics is less than 1%, located only in Latin America.

PEFC currently has no certified forest area in either Africa or Asia. However, Gabon will soon be the first African country producing wood under the PEFC label.

GRAPH 10.2.3

Regional distribution of certified forest area by the PEFC and PEFC-endorsed systems, 2007



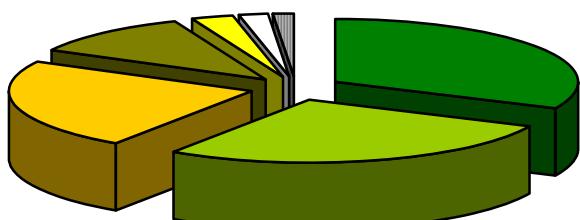
Notes: Distribution of the certified forest area within the PEFC system, including the endorsed CSA and SFI in North America. As of May 2007.

Sources: PEFC, CSA and SFI, 2007.

A different situation is shown by the diverse geographical spread of forests certified by FSC, even though the majority of the area certified still lies in the northern hemisphere (graph 10.2.4). Compared with the distribution of the last survey period (May 2005-May 2006), areas such as western Europe, North America, Latin America and Oceania have lost in their share of global certification, while eastern European and CIS (mainly Russia) managed to increase their share by some 6%, totalling 23%. The geographical division of forest area certified under FSC shows three to four regions that are clearly dominating the distribution. One third is located in North America, approximately 28% in western European countries, 23% in eastern Europe and CIS countries and 11% in Latin America. Other tropical regions such as Africa and Asia remained unchanged in their shares at 3% and 2% respectively. Oceania has dropped to 1% within the FSC distribution.

GRAPH 10.2.4

Regional distribution of certified forest area by FSC, 2007



Note: As of May 2007.

Source: FSC, 2007.

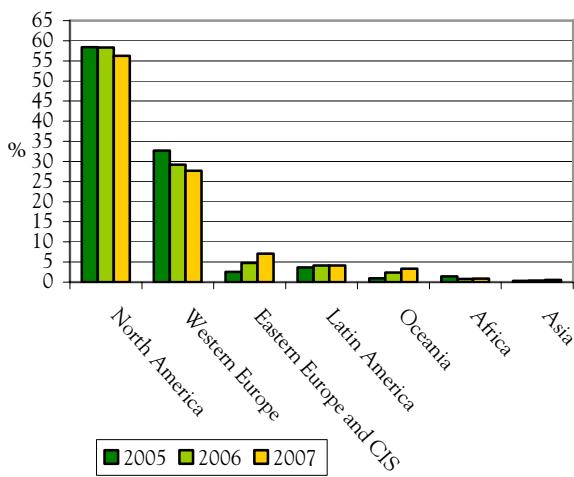
More than 84% of the world's certified forest is located in the northern hemisphere with more than half (56%) located in North America and 28% in western Europe. However, as a logical consequence of having certified most of their forest area during the past decade, all these regions are starting to lose their share of total certified forest to other regions in the world.

North America dropped from 58% to 56% (compared with the last survey period, May 2005-May 2006) and western Europe lost 5% since 2005. Relative to these losses, the proportions of eastern European and CIS countries have increased from 3% to 7% over the last two years. However, even with this change, the area certified outside North America and western Europe still only accounts for 16% of the global total (graph 10.2.5). The least change could be noted in Africa and Latin America during the past two years. This tendency of decreasing shares in North America and western Europe might be a first indicator for the upcoming years when forest management certification is expected to boom in Russia and probably also in Asia (China and Japan drive the entire Asian region).

Nevertheless, this latest trend does not promise any change in the unbalanced distribution of certified forest area within the northern hemisphere (temperate and boreal) and the southern hemisphere (mostly sub-tropical and tropical). While the original driver for certification was uncontrolled deforestation in the tropics, in practice, certification has been far more successful in the north than in the south, and in the developed world than in the developing world.

GRAPH 10.2.5

**Geographical distribution of total certified forest area,
2005-2007**



Notes: All major certification schemes combined. As of May 2007.

Sources: Individual certification systems, Forest Certification Watch and the Canadian Sustainable Forestry Certification Coalition, 2007.

With the exception of Oceania, which had a constant annual increase of 1% during the last three years, the new trend still appears to rather emphasize the disparities between the hemispheres, taking into consideration the ambitious certification efforts currently under way in the world's most forest-rich country, Russia.

In western Europe, slightly more than half of the total forest area is certified, compared with more than one third in North America. The rate of increase in percentage of certified area to the total forest area in these two regions is relatively small but constant. One reason for this marginal increment, especially in the case of Europe, might be that the commercial forest areas in these countries are mostly certified, and significant further certification can be realized only by double certification, which will not be visible in the statistical calculations (graph 10.2.6).

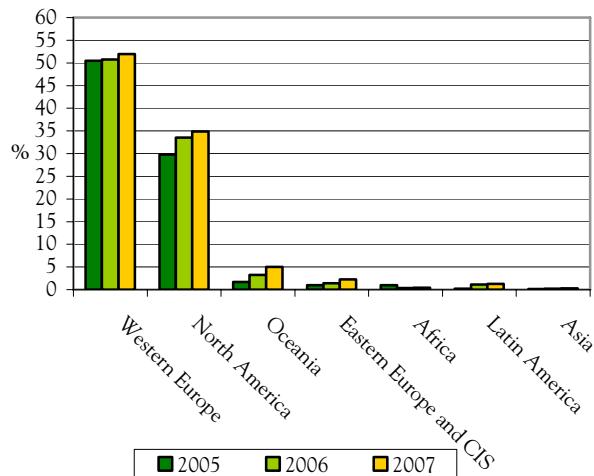
Apart from western Europe and North America, only Oceania (5%) and eastern European countries and CIS (2%) exceed 1% of their total forest area under certification and these trends also mirror the statistical developments or non extension of their certificates. Some African forests experienced delays in gaining certification, or have not had their certificates extended, due to mismanagement or other problems.

The potential roundwood supply from the world's certified forests in 2007 is estimated at approximately 387 million m³. This is some 4% more than during the

last review period (May 2005-May 2006) and shows that the increment rate in roundwood provided from certified resources dropped by half (table 10.2.1). This potential production equates to approximately one quarter of the world's production of industrial roundwood, or about 42% of the industrial roundwood production of North America and western Europe, where 84% of certified forests are situated. Concerning roundwood production from certified forest area, the UNECE regions' average annual removals on forests available for wood supply are multiplied by the percentage of the regions' certified forest area. According to the UNECE/FAO definition, roundwood is composed of industrial roundwood and fuelwood; however, the latter was not considered in this estimation.

GRAPH 10.2.6

**Certified forest as a percentage of total forest area by region,
2005-2007**



Notes: The forest area is based on FAO's State of World's Forest 2007 data, excluding the category "other wooded land". As of May 2007.

Sources: Individual certification systems, Forest Certification Watch, the Canadian Sustainable Forestry Certification Coalition, 2007 and FAO, 2005.

North America has the largest area of certified forest, as it has had during the last four years (graph 10.2.7). Canada, accounting for 127.4 million ha of certified forest, ahead of the US with 36.7 million ha. Even though the rate of increase in certified forest area has slowed further, Canada's certified area still grew by almost 5.5% during the survey period May 2006-May 2007.

TABLE 10.2.1.
Certified forest area and certified roundwood production by region, 2005-2007

Region	Total forest area (million ha)	Total certified forest area (million ha)			% of total forest area certified			Estimated industrial roundwood produced from certified forest (million m ³)			% of estimated industrial roundwood from certified forests (from global roundwood production)		
		2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
North America	470.6	140.2	157.7	164.2	29.8	33.5	34.9	180.6	201.8	210.1	11.4	12.7	13.2
EU/EFTA	155.5	78.5	78.9	80.8	50.5	50.7	52.0	160.1	162.5	166.4	10.1	10.2	10.5
CIS	907.4	8.8	13.0	20.6	1	1.4	2.3	1.6	2.3	3.6	0.1	0.1	0.2
Oceania	197.6	3.4	6.4	9.9	1.7	3.3	5.0	0.9	1.6	2.5	0.1	0.1	0.2
Africa	649.9	6.2	2.1	2.6	1	0.3	0.4	0.7	0.2	0.3	0.0	0.0	0.0
Latin America	964.4	2.3	11.1	12.1	0.2	1.1	1.3	0.4	1.9	2.1	0.0	0.1	0.1
Asia	524.1	0.8	1.1	1.6	0.2	0.2	0.3	0.4	0.5	0.7	0.0	0.0	0.0
World total	3869.5	240.2	270.3	291.8	6.2	7.0	7.5	344.6	370.8	385.7	21.7	23.4	24.3

Notes: The reference for forest area (excluding “other wooded land”) and estimations for the industrial roundwood production from certified forests are based on FAO’s State of the World’s Forest 2005 data. Concerning roundwood production, the subregions’ annual roundwood production from “forests available for wood supply” is multiplied by the percentage of the regions’ certified forest area (i.e. it is assumed that the removals of industrial roundwood from each ha from certified forests is the same as the average for all forest available for wood supply). However, not all certified roundwood is sold with a label.

Sources: Individual certification systems, Forest Certification Watch, the Canadian Sustainable Forestry Certification Coalition, 2007, FAO, 2005 and the authors’ compilation. As of May 2007.

More than half of PEFC-certified forest and almost one quarter of FSC certified area were in Canada. After a loss of certified forest area in 2005, the certified forest area in the US grew by 6% during the last 12 months until May 2007 as a result of an increment of FSC and ATFS.

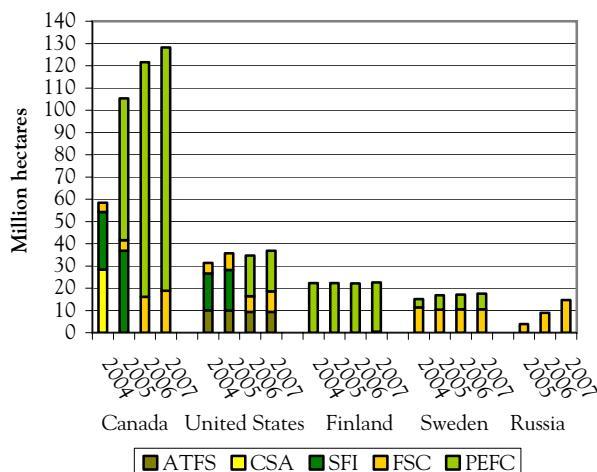
There was minor change in certified forest areas in Finland (22.6 million ha, PEFC only), Sweden (17.5 million ha) and Norway (9.2 million ha). With a 65% increase, Russia (14.7 million ha, FSC only) now ranks fifth and became the country with the second to the most forest area certified by FSC after Canada. Only Australia (9 million ha, PEFC only) and Brazil (5.7 million ha, FSC only) showed similar increase rates at 60% and 32% respectively. Belarus (2.5 million ha), Croatia (2 million ha), Ukraine (1.4 million ha) and the Baltic countries show higher increase rates on lower certified forest area.

In most of the listed countries there is a clear tendency towards a single certification scheme. Canada, Finland, Norway, Germany, Australia and France are clearly dominated by PEFC or PEFC-endorsed systems. In Russia, Poland and Brazil, FSC is the predominant system. The US and Sweden have several schemes certifying almost equal amounts of forest.

In sub-tropical and tropical areas, FSC has issued most of the certificates that are adding up to some 4 million ha in Africa, Latin America and Asia.

GRAPH 10.2.7

Five countries’ certified forest area, 2004-2007



Notes: The graph contains no overlap from double certification. Forest Management certification in Russia, Australia and Brazil only started in 2005. As of May 2007.

Sources: Individual certification systems, country correspondents, Forest Certification Watch, Canadian Sustainable Forestry Certification Coalition, 2007.

10.3 Demand for CFPs

Some major European wood-producing countries such as Finland and Austria have already reached 100% certification of their managed forests. This means that in these countries the entire roundwood production could bear a certification label from one of the major approving schemes. However, due to low consumer awareness and the resulting frequent lack of demand by final consumers, on the one hand, and lack of incentive for the producer (i.e. no clear market advantage such as a price premium), on the other, the vast majority of these products, as in previous years, is marketed without any reference to certification.

Netherlands seem to be an exception, with the consumer being the driving force for CFPs. A 2005 survey of the Dutch market shows that FSC is the most important on-product label. The total share of timber from FSC-certified sources in the Netherlands is about 12.2%, with 9.3% sold as labelled product and 2.9% without any label. The marketed timber sourcing from PEFC certified forests has a share of 22% on the Dutch market, but only 3.9% is sold as labelled, whereas 18.1% is sold without any label. When looking at the Dutch pulp and paper market, the situation appears to be upside-down. PEFC's share in the totally marketed pulp and paper is 21.9% at a labelling percentage of 19.3% and non-labelled selling of 2.6%. The share of pulp and paper derived from FSC-certified sources is 5.7%, of which 4.3% is labelled and 1.4% is not labelled. For sawn softwood, already more than 50% of the market is sustainable in the Netherlands. However, a major effort will be necessary to lift the market share of sustainable tropical hardwood and sustainable temperate hardwood to the same level. Within the sawn softwood market, major growth is still possible in the packaging and pallet industry, a largely untapped market for sustainable timber (Leek and Oldenburger, 2007).

In the UK, a market survey found in 2006 that the insistence on the supply of certified goods is more prevalent among the larger industrial user (e.g. timber frame construction). Certification has yet to feature as an essential requirement among smaller companies where there appears to be a lower awareness and, significantly, fewer public procurement processes in place. In 2005, it was estimated that of all imported goods, just over 10% were subject to specific customer requests with the majority of these goods supplied by the larger sawnwood and panel suppliers (Timberrends, 2007).

Downstream industries do not usually need commodity products to be certified; hence potential supply of CFPs exceeds actual demand in many markets, especially of PEFC-certified CFPs. An additional constraint impeding awareness of CFPs among the public

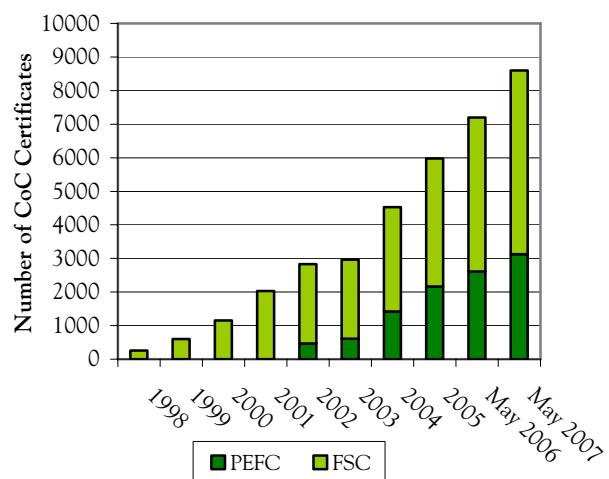
is that most companies do not communicate that their products are certified (Owari et al., 2006). By not labelling certified products, any possible link is missed between consumer demand for assurance of SFM and producers' tremendous expenses for certifying forests and establishing CoC.

FSC CFPs from tropical wood are increasingly appearing on the shelves of do-it-yourself retailers and even supermarket chains selling furniture from tropical wood in western and central Europe.

CFPs remain difficult to quantify due to the lack of official figures and trade classifications. This fundamental issue – independent, compatible and accurate data collection and management as a tool for a reliable market assessment – was also stressed by several key speakers at the UNECE Timber Committee Market Discussions (3-4 October 2006, Geneva). So far, one practicable tool for describing market characteristics and developments of the amount of CFPs in business-to-business markets is the number and type of CoC certificates, serving as a crucial indicator.

Since 1998 the number of such certificates has increased immensely (graph 10.3.1). Between May 2006 and May 2007 the rate of increase was 19.5%, which was about the same rate as during the previous survey period (May 2005-May 2006). By May 2007 the number of certificates worldwide totalled 8,600, of which 63.4% were by FSC and 36.6% by PEFC.

GRAPH 10.3.1
Chain-of-custody certification trends worldwide,
1998-2007



Notes: The numbers denote CoC certificates irrespective of the size of the individual companies or of volume of production or trade. As of May 2007.

Sources: FSC and PEFC, 2007.

This has not changed significantly during the last three survey periods, indicating that both systems have increased at the same rate (20%) over the last years in terms of certificates issued. Prior to that, PEFC had enjoyed a much higher rate than FSC.

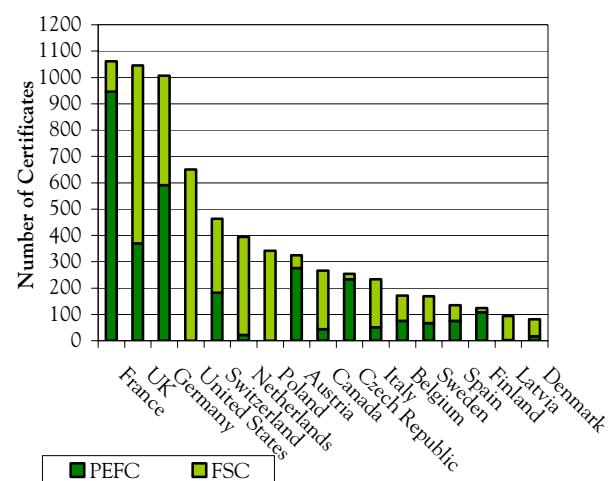
Both the SFI and CSA systems in North America have developed logos, licensing procedures and on-product labelling, but have not yet issued CoC certificates. FSC and PEFC remain the only schemes on the market offering full CoCs for CFPs. By May 2007, FSC CoC certificates were active in 71 countries and PEFC CoC certificates were active in 27 countries.

Using the total number of CoC certificates issued per country as an indicator for business-to-business demand for CFPs, within the UNECE region France (1,061 certificates) leads the UK (1,046 certificates) and Germany (1,007 certificates). France had certificates from both schemes, PEFC accounting for 90% of all certificates issued in the country and FSC accounting for 10% (graph 10.3.2). The UK is now rated second, with 65% of its certificates issued by the FSC system, and 35% by the PEFC system. In third position is Germany, with 59% of its certificates issued by PEFC and 41% by FSC, ahead of the US and Switzerland. Poland lost its position to Switzerland owing to the renewing of the Swiss Q-label, which had been suspended during the last survey period (May 2005-May 2006) due to a non-conformity with the PEFC regulations. This ranking illustrates that in most countries' markets, with the exception of Germany, Belgium and Spain, there is an obvious dominance of one system, tending to converge towards one of the certification schemes. However, within the UNECE region both certification schemes could issue about the same amount of certificates (57% FSC certificates and 43% certificates issued by the PEFC system).

In countries outside the UNECE region, almost all companies holding a CoC certificate obtained their certificates from FSC (97% certificates by FSC and 3% issued by PEFC). Japan leads with 384 certificates and is followed by China, with 262 certificates, which took over Brazil, with 202 certificates in May 2006 (graph 10.3.3). The important market growth for CFPs for Asia is illustrated over the last year by the dominant position of Japan, the 77% growth in CoC certificates in China and the large number of certificates issued in Viet Nam (119), Malaysia (66) and Indonesia (34). Growth in Asia is rising in parallel to some countries in South America. However, companies in these regions are most often exporting to North America and Europe, rather than supplying their domestic markets, which have not yet demanded certified products.

GRAPH 10.3.2

Chain-of-custody certificate distribution within the UNECE region, 2007

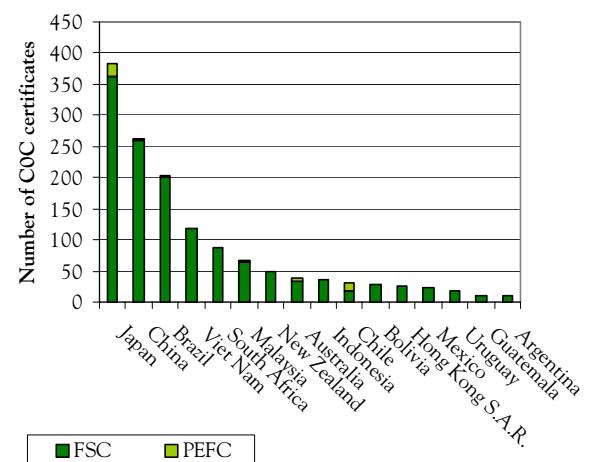


Notes: Countries with fewer than 50 CoC certificates are not shown. The numbers denote CoC certificates irrespective of the size of the individual companies as of May 2007.

Source: FSC, PEFC and authors' compilation, 2007.

GRAPH 10.3.3

Chain-of-custody distribution outside UNECE region, 2007



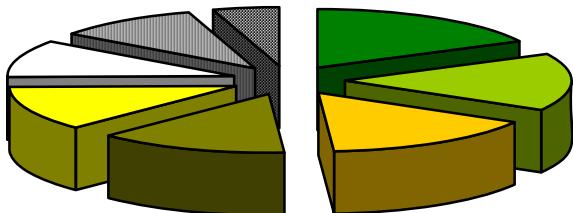
Notes: The graph only includes countries with ten or more CoC certificates. The numbers denote CoC certificates irrespective of the size of the individual companies as of May 2007. As of May 2007, neither SFI, CSA nor ATFS have CoC certificates.

Sources: FSC, PEFC and authors' compilation, 2007.

The distribution of CoC certificates across the product range illustrates that companies from all wood-based industries and trade sectors hold CoC certificates. Companies holding CoC certificates of FSC (64%) cover a relatively wide product range (graph 10.3.4). The distribution of FSC-issued CoC certificates among industry sectors changed somewhat over the last year.

The main reason for the change in the allocation might be the statistical system by FSC, which is undergoing a modification affecting mainly the product category definitions. Hence, roundwood and other primary forest industry, together with panels and sawnwood producers, hold approximately half of the CoC certificates, with relatively equal shares of between 15-18%. Pulp and paper, together with furniture producers, account for the next quarter at approximately even shares and the fourth quarter is divided by window and door producers (10%), wood manufacturers (10%) and other sectors (5%).

GRAPH 10.3.4

FSC chain-of-custody distribution by industry sector, 2007

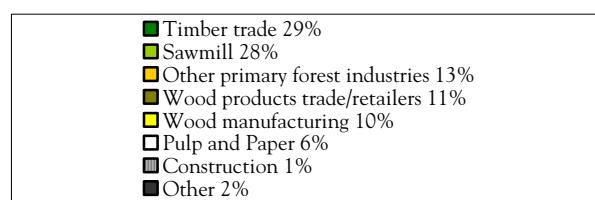
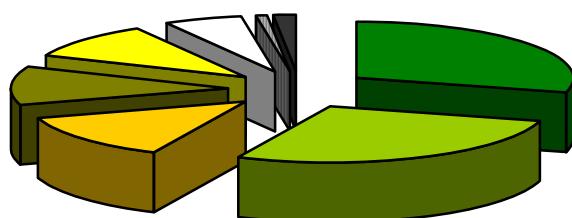
- Roundwood and other primary forest industry 17%
- Panels 16%
- Sawnwood 15%
- Pulp & paper 14%
- Furniture 12%
- Windows & doors 10%
- Wood manufacturing 10%
- Other 5%

Note: Some overlap between the industry sectors is possible.

Source: FSC, 2007.

Generally, the distribution of PEFC-issued CoC certificates (36% of the total) did not change over the last year (graph 10.3.5). PEFC CoC certificates are mainly issued for timber trade and sawmilling, with almost the same shares, approximately one third of the total. These two PEFC CoC main sectors are followed by other primary forest industries (13%). The wood products trade and retailing sector and the secondary wood manufacturing sector each hold some 10% of the PEFC CoC certificates' spectrum. The rest is distributed among pulp and paper (6%), other forest industry sectors (2%) and the construction sector (1%). Different accounting and product groupings do not permit a direct comparison between the industry sectors and products certified by the schemes.

GRAPH 10.3.5

PEFC chain-of-custody distribution by industry sector, 2007

Note: Some overlap between the industry sectors is possible.

Source: PEFC, 2007.

10.4 Policy issues

10.4.1 Public procurement and governance in North America

Six major trends connected to public lands certified wood procurement and governance either currently affect or are likely to soon affect the growth of certified supply and market demand for CFPs in the US.

10.4.1.1 Continued growth of public forestland certification and impacts on private forests

Of the 250 million ha of forestland in the US, approximately 37% is public, private non-industrial ownership is about 45% (Butler et al., 2003). There are over 10 million non-industrial forestland owners across the US who are expected to provide 60% of the US timber supply by 2030 and who often rely on public land managers for forest management information and access to markets (Zhang et al., 2005). Public forestland managers and public agencies throughout the US are proving to be significant catalysts in both the growth of certified wood supply and growth of market demand for certified wood product. In 2007, public land certifications under the SFI system were slightly over 6.4 million ha, equal to 12.5% of the total SFI certified area in the US (SFI, 2007). Public land certification comprised 71% of all FSC certified volume in the US, equal to 6.6 million ha of a total of 9.2 million ha (FSC-US, 2007).

Initial discussions of certification of public forestlands began in 1997, and with the states of Minnesota and Pennsylvania becoming FSC-certified in 1998. By 2006,

over 3.6 million ha of state forestlands in ten states⁹ were certified either by FSC, SFI, or both (Mater, 2006).

In March 2006, the USDA Forest Service authorized the country's first official pilot projects in forest certification assessments. National forests comprise some 78 million ha of forestland throughout the country and are significant contributors to overall wood flow in many regions across the US. FSC assessments have so far been conducted on about 2 million ha of national forestlands in the states of Oregon, Pennsylvania, Wisconsin and Florida. Results of these FSC assessments will be released to the public in mid-2007, but first results indicate that FSC-US currently lacks specific standards to certify national forests. However, if FSC developed the necessary standards, then part or all of the national forests could be certified. This could open up geographically dispersed market supply channels, which could also benefit non-industrial private forestland owners (NIPFs) across the US, who typically have trouble accessing certified markets due to their smaller offer.

10.4.1.2 Paper purchasers driving growth in market demand for certified supply

Major environmental challenges to users of uncertified paper products began in 2002, which resulted in an unprecedented acceleration of certified wood coming from public forestlands. Starting in 2003, the world's largest magazine company had set time-bound targets for achieving over 85% certified (FSC or SFI) content in their annual paper purchases (600,000 tons/year) by 2006. This resulted in certification of state forests in Michigan, Wisconsin, and Maryland.

In 2006-2007, a nationwide speciality retailer of high quality home products combined with the largest publishing company in the UK and a worldwide computer manufacturer to set time-bound limits for using certified paper in their catalogues. These three companies alone have a combined purchasing volume of over 250,000 tons of paper per year.

Out of the 781 CoC certificate holders in the US, 55% are paper manufacturers, printers, and merchants (FSC, 2007). In Canada, 51% of FSC CoC certificate holders are paper manufacturers, printers and merchants located throughout all Canadian provinces (FSC-Canada, 2007).

10.4.1.3 Impact of green building growth impact and Leadership in Energy and Environmental Design

The unprecedented growth of the green building market in the US, spearheaded by the US Green Building Council and the Leadership in Energy and Environmental Design (LEED) programme, has significantly impacted both awareness and purchase power for FSC-certified wood in building construction. Interestingly, it is public agencies across the US that drive a substantial portion of that market demand, as LEED allows for credits in using wood only sourced from FSC-certified supplies. As of May 2007, LEED initiatives including legislation, executive orders, resolutions, ordinances, policies and incentives are found in 55 cities, 11 counties and 22 states across the US.

Awareness and use of certified wood in housing construction appears strongest in west coast states in the US. In 2006, Washington State-based Cintrafor released the results of a survey they conducted with 240 residential builders from across the US (Ganguly, 2006). Results showed that 77% of builders in west coast states were aware of certified wood and had home buyers who were willing to pay premium for a home built with certified wood. 70% of those west coast builders who were aware of certified wood actually use certified wood in the homes they build, with over 56% of their softwood framing material coming from certified supply. Builders in the central states and the east coast were less aware of certified wood, but even those percentages were markedly higher than responses to similar surveys conducted just five years earlier (Ganguly, 2006).

10.4.1.4 Removal of woody biomass from public forestlands for reduction of catastrophic wildfires and use in green energy and green biofuels products

In 2005, the US adopted legislation to reduce fuel loads and catastrophic wildfires on public forestlands. The area burned in 2006 was 131% greater than that which burned in 2000, and for 2006, the USDA Forest Service spent \$1.5 billion in suppression costs on over 0.8 million ha burned. Nearly half of the Forest Service's 2008 budget is allocated to fire suppression (USDA Forest Service, 2007).

The US Congress established an interagency programme called CROP (coordinated resource offering protocol) to help meet fuel load reduction goals on an area of 12 million ha of federal land by increasing private investment in producing wood products, energy, and biofuels through inter-agency coordination, levelization, and contracting of annual biomass supply to be removed. Energy and biofuels investors, as well as biotechnology companies, have been particularly interested in the

⁹ In addition to Minnesota and Pennsylvania, Maine, Maryland, Michigan, New York, North Carolina, Tennessee, Washington and Wisconsin.

CROP results, given the national push toward green energy and green fuels.

In 2007, several political levels in the US proposed that the country should produce more than 100 million tons per year of biofuels by 2017. The Energy Policy Act already requires that 20 million tons per year of biofuels be produced by 2012. The higher requirement forces woody biomass to be included in the feedstock mix. At the same time, this push towards woody biomass removal from public lands has fostered new environmental concerns over sustainable, well-managed biomass removal, and looks certain to foster certification of biomass removal and standards development for public lands.

10.4.1.5 Woody biomass in carbon sequestration projects and their certification requirement

Public forestland managers in the US and Canada are now actively reviewing the potential for gaining carbon credits and payments for carbon offsetting from management of their lands, and forest certification is looking to be an important element. Global carbon markets have doubled in size over the last year and current estimates place regulated markets at \$21.5 billion and voluntary markets at about \$100 million for the first three quarters of 2006 (Bayon et al., 2007). The prospects for continued growth in carbon markets are strong due to the strength of growing voluntary carbon markets. Whereas most regulatory carbon markets currently do not allow for reporting carbon sequestration by forestry practices, the voluntary carbon markets do.

In the US, there are two regional carbon registries that not only allow for reporting of carbon sequestration by forestry practices, but also include FSC and SFI certification as a requirement for forest-based offset verification. The Eastern Climate Registry (ECR) – only considering afforestation and deforestation projects for registry listing, and the California Climate Action Registry (CCAR) – allowing for certified sustainable forest management projects for registry listing. As a consequence, certification is more likely to help facilitate sales of carbon credits in the US – a fact likely to gain attention from public land managers.

10.4.1.6 Introduction of certified hybrid poplar supply into solid wood and biofuel markets

In 2002, FSC certified the first fast-growing, short-rotation hybrid poplar plantation (6,000 ha) in the US. The plantation was transitioned from a fibre focus to a sawlog focus, and in 2007 approximately 100,000 m³ of FCS-certified solid wood is to be produced. This production flows into North American markets

established for the “new” wood species for both certified solid wood and biomass supply (Mater, 2007).

The Pacific Northwest is likely to serve as a strong catalyst for hybrid poplar plantation certification across the US. Currently, there are approximately 36,400 ha of hybrid poplars grown throughout the US for fibre use (Bioenergy Feedstock Information Network, 2007). The certified hybrid poplar wood flow is expected to spark certification of additional plantations across the US.

In addition, 2007 study results from the US Department of Agriculture revealed that when compared with the lifecycle of gasoline and diesel, ethanol and biodiesel from corn and soybean rotations reduced greenhouse gas emissions by nearly 40%, reed canarygrass by 85%, and switchgrass and hybrid poplar by 115%.

10.4.2 Sustainable forest management and illegal logging

It is difficult to estimate the exact scale of illegal logging; but this problem is still rampant or even growing, according to an International Experts Meeting on Illegal Logging held in March 2007, in Tokyo. In order to follow up on the G8 Action Plan “Climate Change, Clean Energy and Sustainable Development” that was formulated in Gleneagles, UK, in 2005, and to prepare for the G8 summit in 2008 in Japan, the Japanese Foreign Ministry invited 17 major timber-producing and timber-consuming countries¹⁰ and representatives/researchers from relevant international organizations and institutions¹¹ who are actively dealing with the topic to meet together and to collectively work on possible solutions to resolve this complex issue.

Regarding certification, the experts noted that while there were high hopes, the rate of expansion of total certified forest area in tropical supplier countries was slow. Participants discussed whether certification could be considered an instrument for tackling illegal logging, with some considering that certification could best be used to verify SFM and build on existing initiatives. Regarding the social factor – which has high impact on the issues of need-based and greed-based illegal logging, the experts stated that certification might hence be seen as one powerful tool for fighting illegal logging. There is a distinct link between the relative share of certified forest

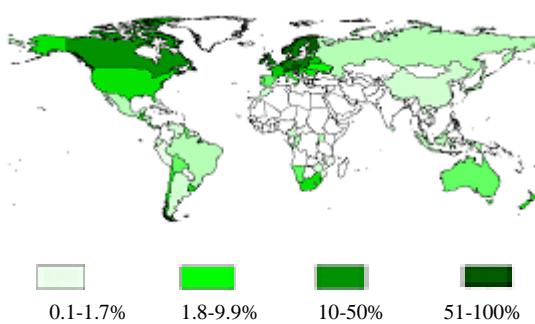
¹⁰ Australia, Canada, China, Cameroon, Democratic Republic of Congo, France, Germany, Indonesia, Italy, Japan, Malaysia, Netherlands, New Zealand, Papua New Guinea, Russia, UK, US, and EU.

¹¹ Center for International Forestry Research (CIFOR), FAO, Institute for Global Environmental Strategies (IGES), International Tropical Timber Organization (ITTO), National Institute for Environmental Studies (NIES), International Institute for Applied Systems Analysis (IIASA) and the World Bank.

area in percentage of the total national forest area and those areas which have the highest illegal logging; the tropical regions of the southern hemisphere are lacking certification (the darker the green area, the higher the share of forest area certified) (figure 10.4.1). At the same time, forest-rich countries that are showing light green or white areas have highest potentials for future increase in certified forest area, which might – once certification is established – tackle and curb illegal logging to a certain degree (Kraxner, 2007a).

FIGURE 10.4.1

Global distribution of certified forest area as a percentage of total forest area by countries, 2007



Note: Relative share of certified forest in percent of the countries' total forest area. The forest area is based on FAO's State of the World's Forest 2007 data, excluding the category "other wooded land." Intervals for forest area certified as percentage of total forest area are determined by frequency distribution (natural breaks).

Sources: Individual certification systems 2007, Forest Certification Watch, the Canadian Sustainable Forestry Certification Coalition, 2006 and FAO, 2007.

Several producer countries described their experience with certification and participants noted that attention should also be paid to the independently developed certification schemes that now exist in some tropical supplier countries. It was further pointed out that certification must be balanced against other initiatives with respect to costs and impacts.

Combining findings by Nilsson (2006) and the results from table 10.2.1 above, the volume of industrial wood from illegal sources (350-650 million m³/year) is estimated at least as high as the volume of industrial wood deriving from certified forests (385 million m³/year). The total share of illegal logging is estimated at 20-40% of the total global industrial wood production. In addition to these high figures it has to be considered that according to the certification percentage revealed in the figure above, the main share of the wood production from certified forest originates from the northern hemisphere, while a huge part of illegal logging is happening in the southern hemisphere.

The volume of illegally harvested wood is substantial and it affects the prices of industrial wood. Illegal logging is responsible for vast environmental damage for certain industry sectors in both developing and developed countries, but the damage is also economic, i.e. through reduced prices for legal timber, which must compete with illegal timber in a distorted marketplace. The impact of illegal logging on the American wood market is estimated to be a price reduction of 7-15% (Brack, 2005). The global annual loss has been estimated at approximately \$15 billion, taking account of losses to Governments and to legal competitors (World Bank, 2006a).

Using a small share of this \$15 billion for the certification of the most endangered forest areas might have a multiple positive effect. On the one hand (assuming that certification is an appropriate tool for tackling illegal logging) the monetary damage could be reduced drastically and on the other hand certified sustainable forest management might protect the forest areas at risk from being cut illegally or burnt down for other incentives. The direct certification costs vary from \$1 up to several dollars per ha (Hansen et al., 2006) which means that for instance some 150 million ha of endangered forest might be certified (for more than one year) when calculating at an average ha price of \$10 for direct certification and using only 10% of the annual monetary damage of illegal logging.

At the expert meeting in Japan, it was stated that discrepancies in trade statistics continue to be a problem, which both exporter and importer countries were encouraged to take steps to address. It was also noted that although certification is a market-based instrument, there are no data on the total volume of wood certified globally, and that such a data system is urgently needed. The FAO/UNECE Working Party on Forest Economics and Statistics reached the same conclusion at their 2006 session. In addition to the ecological damage caused by illegal actions in the forests there might be also a link between illegal logging and wood supply (Nilsson, 2007). Hence, detailed knowledge of the wood markets is definitely an asset when discussing the illegality issue. The drivers for certification were identified as market access, demonstration of good forest stewardship and membership in associations that promote certification.

10.4.3 Certification in the Russian Federation

In November 2006, the new Forest Code of the Russian Federation was adopted by the State Duma. Under chapter 1, article 1, one of the first principles mentioned is the enhancement of SFM and biological diversity (World Bank, 2006b).

Since 1999, approximately 15 million ha of forest area have been certified in Russia, so far exclusively by FSC.

The great majority of this area is in the European part of the Federation, but there are also some certified forests in central Siberia, eastern Siberia and the Altai region, where markets show less sensitivity to the value of sustainable forestry than in the European part (Tysiachniouk, 2004). From 2005 to 2006 the certified area in Russia has almost tripled and during this year's survey period, the area almost doubled. Russia has the largest forest area in the world, with 763.5 million ha, or 22% of the world's forests, and with an annual harvest of about 168 million m³. The total amount of certified forest area is still fairly low (less than 2%); however, the growth rate of certified forest area as well as CoC certificates issued, which almost doubled from 27 to 49 (all FSC) during the survey period May 2006-May 2007, mirrors the enormous potential of Russia and justifies special focus on its development.

PEFC started its process in Russia in 2004 and established in September 2006, a "Partnership on the Development of PEFC Forest Certification", which reunites and represents the two Russian forest certification initiatives in the PEFC Council. These are: the National Council of Voluntary Forest Certification in Russia (RSFC), and the Russian National Council for Forest Certification. Both initiatives have revealed that they will submit their certification systems for PEFC endorsement in due course. The approach Russia has taken by uniting two independent forest certification systems under one umbrella organization is similar to the example of the SFI and the ATFS: both PEFC member systems through their US member organization in PEFC, the Sustainable Forestry Board.

10.4.4 Developments in the Japanese and Chinese markets for CFPs

Japan and China are the driving economies for the regional CFP market in Eastern and Southeast Asia, mainly because of their importance on the global wood market. The dominating CoC scheme in both Japan and China is FSC. Although FSC is also the only scheme for forest management certification in China, the National Forest Certification Scheme of China is under development and will be formally launched within the year 2007 (Lu, 2007). PEFC has not yet issued certificates in Japan or China but has established a PEFC Asia Promotions Office in Tokyo.

In Japan, paper industries have constituted the majority of CoC certification holders (368 (FSC) and 24 (PEFC) CoC certificates by May 2007), receiving two thirds of the certificates issued. The main certified products sold were paper for plain paper copy and printing, wood chips as raw paper material, and printed material such as environmental reports and calendars (Owari and Sawanobori, 2007). Among the customers,

large Japanese corporations, mainly in the manufacturing industry, have been driving the demand for certified paper. As the use of recycled paper becomes the norm, Japanese customers consider certified paper an environmentally friendly substitute. Along with the public procurement policy, the revised purchasing guidelines for printing and copying papers by the Green Purchasing Network (GNP) led corporations to use certified paper. By labelling printed material with certification logos, they can communicate their sense of responsibility to stakeholders. In contrast, the development of a market for certified wood products has been stagnating in Japan. Do-it-yourself chains and house builders seem to have little interest in certified products. The lack of demand from both retailers and end-users has resulted in a small market for CFPs (Owari and Sawanobori, 2007).

The share of government procurement is estimated at 2-3% of the total wood demand in Japan (Morita, 2007). According to the amended Green Purchasing Law, contractors of government procurement are responsible for verifying the legality and sustainability of wood and wood products. The target items include paper, stationary, office furniture, interior fixtures and beddings, and wood material for public-work projects (Goho-Wood Navi, 2007).

In China, FSC had granted 284 CoC certificates by May 2007 (77% growth from the last year's survey), most of which were in partnership with foreign companies. The main certified product was small furniture for export to Europe. The certified companies were mainly located in Guangdong, Hong Kong, and Zhejiang, where the economy is relatively developed. Large foreign furniture retailers such as B&Q, IKEA, and Home Depot plan to obtain certified material from China's domestic forests, resulting in growing attention to forest management certification in the country. However, certification of forests has been limited due to high costs and difficult communication (Wang and Xu, 2006).

As of May 2007, PEFC has issued four CoC certificates in China. Complementary to the Promotion Office in UK and the recently established office in Japan, PEFC also launched an office in China, which is considered to be a key area in international globalization and trade. The aim of the PEFC China Office is to build market awareness and acceptance of PEFC-CFPs in Asian markets. This also involves Chinese public and corporate procurement policies choosing certification systems endorsed by PEFC, as an assurance of legal and sustainable supply (PEFC, 2007).

The 2006 Timber Committee Market Discussions had a theme of "China's influence on forest products markets in the UNECE region". It was stressed that China's total

forest resources remain largely unknown with respect to extension and quality, and that special attention regarding forest management certification will have to be put on forest plantations in China. Additionally, socio-economic factors such as population dynamics and GDP development, as well as future environmental and climate policies, will have a strong influence on certification in that country with respective consequences on the global market development.

Participants in the Timber Committee also agreed that only an improved and centralized data collection and data management system on CFPs would lead to better market evaluation and prediction in the field of SFM and CoC certification.

10.4.5 Biomass for bioenergy – biofuel potential and its certification

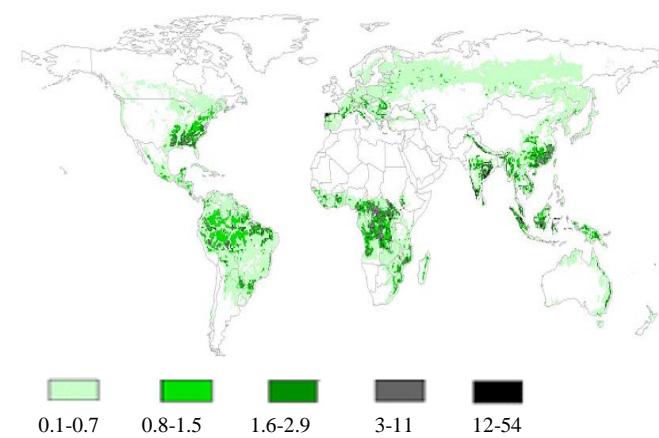
Considering new governmental renewable energy policies, high shares of biomass in the global energy portfolio are predicted for the coming decades. A huge volume of this biomass for bioenergy will be transformed into and applied as liquid biofuels, which consequently makes the transport sector an important driver of this development. Under the auspices of Germany's leading automotive and transport industry, an expert workshop on "Sustainable biofuels – How to certify them?" was held in February 2007 in Berlin. It was stressed that under current technical and socio-economic conditions, and given the uncertainties of the climate change impacts, the growing demand for biofuels could only be satisfied by using sustainably produced woody biomass (Kraxner, 2007b). Results of a global bioenergy model presented at the workshop show biomass production in 2100 will be concentrated in the tropical zones, North America, Europe, China and Russia.

These findings might put additional pressure on the remaining natural forest areas, especially in the tropical regions. When comparing the regions of high forest certification (shown in figure 10.4.1) to the areas with the highest potential of biomass for bioenergy production, it is easy to detect high correspondence (figure 10.4.2). Consequently, certification of forest area and the resulting product chain, such as biofuels, should go hand in hand in order to assure protection from e.g.. illegal logging and unsustainable production (Kraxner and Obersteiner, 2007). The certification schemes are going ahead in the areas mentioned. Taking into account these findings, certification is lacking from some of the forests where it is most needed.

The existing systems for forest certification might serve as a pool for experience, or even as a partner, when designing a special certification system for biofuels. Parts of the certification regulations from FSC or PEFC might be taken as foundations and could be adapted accordingly

and extended with CO₂ (GHG) balance and further socio-economic criteria and indicators (Woods, 2007). Experts especially stressed the importance of legitimacy and credibility of such a new certification system for biofuels (Müller, 2007).

FIGURE 10.4.2
Accumulated biomass for bioenergy production, 2000-2100



Note: Spatially explicit cumulative biomass production for bioenergy between 2000-2100 in Exa Joules per grid.

Source: Rokityanskiy et al., 2006.

The recent development of biofuels certification is mainly driven by the transport industry, NGOs, the education sector, and national initiatives. The Energy Center at the Ecole Polytechnique Fédérale de Lausanne (EPFL) in Lausanne, Switzerland, just announced the launch of a multi-stakeholder Roundtable on Sustainable Biofuels, to draft global standards for sustainable biofuels production and processing. Founding Steering Board members include, among others, WWF, FSC, Toyota, BP, the National Wildlife Federation, Shell, the Dutch and Swiss Governments, the UN Foundation, Petrobras, the World Economic Forum, and Friends of the Earth Brazil. Areas of interest will include protecting biodiversity, water resources, and labor and land rights, as well as encouraging biofuels' contribution to economic development in rural areas (ISEAL, 2007; EPFL, 2007).

10.4.6 Certification and forest plantations

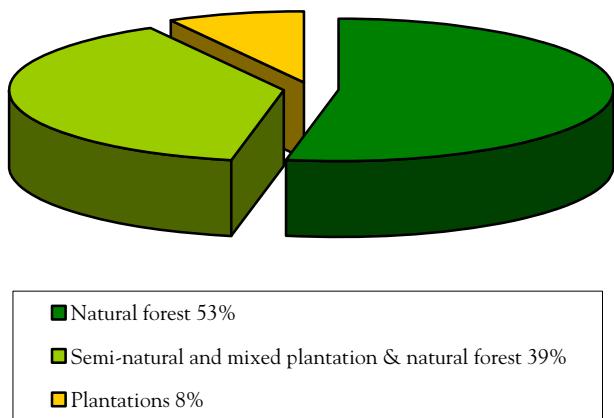
Together with the new topic of biofuels certification, certification of forest plantations is considered crucial for the future development of labeled marketing of forest management and wooden products.

By March 2007, FSC reported that of all forests under its scheme, 8% were plantations (graph 10.4.1). Totaling almost 50% of FSC certified forest area, including the

categories semi-natural and mixed plantation and natural forest (39%), certification of plantations makes up an important part of this certification scheme. Assuming that the relative distribution by forest type might be similar within other certification schemes, and taking into account the different definitions of forest types by the schemes, up to half of the globally certified forest areas might be plantations or mixed plantation, and semi-natural/natural forest.

GRAPH 10.4.1

Percentage of total FSC certified area by forest type, March 2007



Notes: Due to missing statistics and varying definitions of plantation forestry by the different certification schemes a comparison of certified area by forest type and certification system was not feasible by May 2007. FSC has been selected as an example.

Source: FSC, 2007.

Plantations and monocultures are controversial regarding their environmental impacts, e.g. potential lack of biodiversity, occasional use of non-native species and fertilization. Hence, certification of large-scale plantations is a complicated topic with possible damage to the image of individual schemes (Langmack, 2006).

Natural and plantation forest management in sensitive regions in the world, should be of particular interest for certification activities. Fast-growing species such as eucalyptus, pine, bamboo, or hybrid poplar are required by both the biomass for bioenergy sector, as well as for the wood and paper processing. Plantations are seen as a major contributor to satisfying the predicted high demand for forest resources in the future (Kraxner, 2007b).

10.4.7 Non-wood forest product certification

PEFC now provides a new option for non-wood forest products (NWFPs), as part of PEFC's international CoC. NWFPs can be PEFC-certified since November 2006; however, only a few examples are on the market. The new PEFC requirements allow companies to market products such as berries and mushrooms, which come from PEFC-certified forests, with the PEFC logo. For certification NWFPs neither include forest-related services, such as tourism and sports, nor products whose origin cannot be linked to a specific forest property, such as animals, birds, air and water (PEFC, 2006).

Among the NWFPs that are already on the market, there is certified cork in Spain and Portugal, essential oil in Italy (*Pinus mugo* essential oil) as well as honey, chestnuts and berries. The potential for certified NWFPs is considered to be high and soon there will also be certified truffles and mushrooms from PEFC-certified Italian forests, on the market. Furthermore, there are plans to market PEFC-certified meat from certified forest in Italy, France and Spain. Meat from game requires special hunting plans and fenced forest areas are prerequisites for this type of NWFP (Brunori, 2007).

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