

**The information and statistics set out in this section have in part been extracted from various publicly available official sources, namely, FAO, ITTO, the International Monetary Fund, the United Nation Economic Commission for Europe and government authorities in various countries. No independent verification has been carried out on such information and statistics. Reasonable care has been exercised by our Directors in extracting and reproducing such information. Our Company, the Global Coordinator, the Joint Sponsors, the Underwriters, their respective directors and advisers and any other party involved in the Global Offering make no representation as to the accuracy of such information and statistics, which may not be consistent with each other or other information compiled by other official or unofficial sources and may not be complete or up-to-date.**

**Investors should also note that we commissioned Pöyry, our independent technical consultant, to prepare an independent technical report on our forest and processing operations, which is reproduced in Appendix VI to this Prospectus. Information and statistics from the independent technical report prepared by Pöyry on the timber industry have been included in this Prospectus, including this section and the "Business" section. Pöyry is a global consulting and engineering firm focusing on the energy, forest industry and infrastructure and environment sectors. The amount of fees payable to Pöyry is not contingent on our Company's approval for its work. Investors should note the scope of work, assumptions and qualifications of Pöyry's independent technical report which are set out in the introductory section of the report at pages VI-1 to VI-5 and VI-9 to VI-11.**

## **OVERVIEW OF THE FORESTRY INDUSTRY**

### **Introduction**

The global forestry industry provides timber resources and processed wood products for various industries. The industry is generally divided into upstream and downstream activities. Upstream activities focus on forest resource management including forest planning, planting, stand tending and/or management of the forest as well as the harvesting and transportation of logs. The wood-based downstream activities consist of processing of logs into products such as sawn timber, plywood, veneer, reconstituted panel products, pulp and paper, as well as further value-added processing activities such as production of moldings and other housing and building materials including flooring and furniture. Logs are generally sold to plywood and veneer manufacturers, sawn timber and other solid wood products manufacturers, or as roundwood fiber to pulp and paper or reconstituted panel product manufacturers. Logs that are supplied to other solid wood products manufacturers are commonly processed into plywood, veneer or sawn timber with residual fiber from these processes used for the production of reconstituted panel products or pulp and paper. In general, the forest product markets in developing countries are focused on raw materials and primary processed products such as logs and commodity grade plywood, while the developed countries are increasingly looking for higher value-added products.

**Global forest resources**

Forests include natural forests, forest plantations, rubberwood plantations, forest stands on agricultural lands and special purpose forests such as those maintained for conservation. According to the FAO, total world forest area as at 2005 is estimated at 3,952 million hectares, or approximately 30% of total land area, which corresponds to an average of 0.62 ha per capita. Natural forests represent over 95% of the world forest resources, while man-made industrial plantation forests make up only approximately 3.5%, although they are expanding rapidly. The table below shows FAO's estimation of the distribution of forests in the world in 2005 by sub-regions:

**Distribution of forests by sub-region 2005**

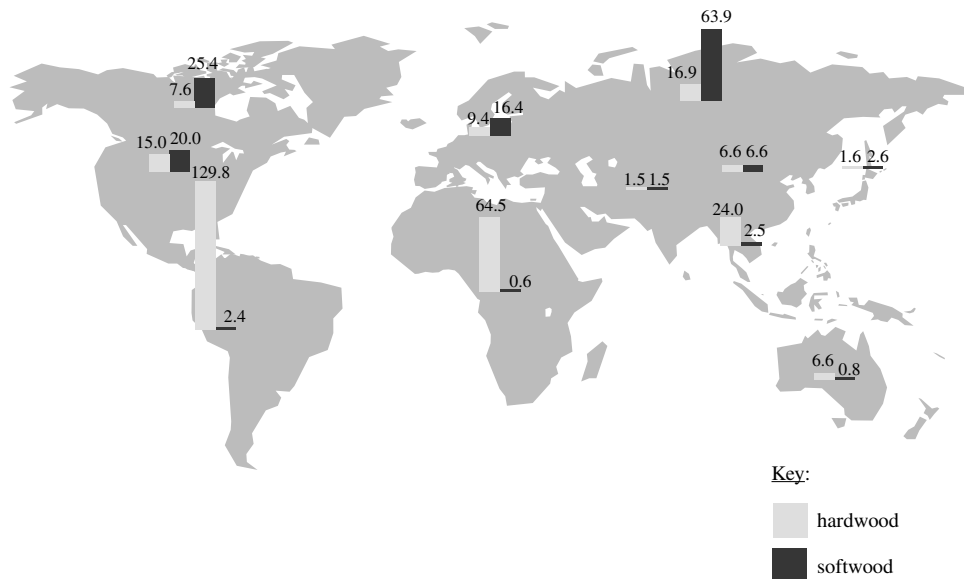
<b>Region/sub-region</b>	<b>Forest area (<i>'000 ha</i>)</b>	<b>% of global forest area</b>
Eastern and Southern Africa .....	226,534	5.7
Northern Africa .....	131,048	3.3
Western and Central Africa .....	277,829	7.0
<b>Total Africa</b> .....	<b>635,412</b>	<b>16.1</b>
East Asia .....	244,862	6.2
South and Southeast Asia .....	283,127	7.2
Western and Central Asia .....	43,588	1.1
<b>Total Asia</b> .....	<b>571,577</b>	<b>14.5</b>
<b>Total Europe</b> .....	<b>1,001,394</b>	<b>25.3</b>
Caribbean .....	5,974	0.2
Central America .....	22,411	0.6
North America .....	677,464	17.1
<b>Total North and Central America</b> .....	<b>705,849</b>	<b>17.9</b>
<b>Total Australasia</b> .....	<b>206,254</b>	<b>5.2</b>
<b>Total South America</b> .....	<b>831,540</b>	<b>21.0</b>
<b>World</b> .....	<b>3,952,025</b>	<b>100.0</b>

Source: FAO (2005)

Total forest area in the Asia and Australasia regions in 2005 is estimated to be over 750 million hectares. Natural forests account for around 85% of this resource base and industrial plantation forests account for approximately 15%, which is much higher than the global average, mainly as a result of the plantation resource bases in China, Indonesia, Australia and New Zealand.

According to Pöyry, it is estimated that the global growing stock of timber resource amounted to approximately 426 million m<sup>3</sup> in 2005, of which approximately 67% is hardwood and the remainder softwood. The following illustrates the estimated spread of growing stock of forest resources globally in 2005:

**Growing Stock of Global Forest Resources as at 2005 — million m<sup>3</sup>**



Source: Pöyry

**Tropical and subtropical hardwood resources**

Tropical and subtropical forests, from which tropical hardwood species are derived, are mainly located in South America, Asia and Africa. There are many different hardwood species (with over 100 species of traded hardwood from Asia alone) with many having specific appearances and uses. In general, popular hardwood species are desirable for their durability, appearance (color and wood grain) and woodworking properties such as machining, screw holding and finishing.

**Deforestation and plantation initiatives**

As demonstrated in the above diagram on growing stock of global forest resource, forest area throughout the world is unevenly distributed. While forest area in developed countries has stabilized and is generally increasing at a modest rate each year, deforestation has continued to be a major issue in developing countries, particularly for tropical and sub-tropical forests. In many countries in the Asia-Pacific region, notably Indonesia and China, there have been increasing restrictions on the level of harvest designed to conserve the remaining forest areas. One consequence of this is a significant and growing shortage of large-diameter logs, both softwood and hardwood, which are particularly favored by plywood and sawn timber producers.

According to the FAO, forests and trees are being planted for many purposes and at increasing rates. FAO estimates that in 2005 forest plantations comprised a total of approximately 140 million hectares which make up an estimated 3.5% of total forest area approximately. The area of forest plantations has increased by about 2.8 million hectares per year in the period 2000-2005, 87% of which are productive forest plantations.

## **Impact of illegal logging**

In recent years, there has been growing concern about illegal logging or illegal forestry activity in many parts of the world. Recent studies indicate that illegal logging has been a major factor in depressing wood prices. For example, the studies point to illegal logging of tropical timber having been a pervasive problem in Indonesia, where the proportion of total wood supply attributable to illegal logging activity has been estimated at 40% to 80%. As Indonesia was the world's second largest tropical log producer in 2005, illegal logging in Indonesia has had a significant impact on global trade in tropical hardwood.

The Indonesian government has acknowledged that illegal logging is a significant problem and has recently adopted measures to tackle illegal logging. Measures include re-introducing a log export ban in 2001, which banned all exports of ramin (a common specie of tree in Indonesia), except for a limited quantity of certified wood exported by one company. Malaysia also introduced legislation banning the import of logs and squared timber from Indonesia in response to the Indonesian log export ban. The Indonesian Government also signed bilateral agreements with several importing countries including China, Japan and the UK to help curb illegal logging. Since the reintroduction of the log export ban and the introduction of tighter controls to regulate illegal trade, Indonesia's tropical log exports declined by 85% between 2002 and 2003, from 646,000 m<sup>3</sup> in 2002 to 100,000 m<sup>3</sup> in 2003, according to ITTO. ITTO statistics also showed that Indonesia's tropical log exports remained at 100,000 m<sup>3</sup> in 2004, with no tropical log exports in 2005. Despite these initiatives and whilst reduction of illegal logging has become the stated top priority for improving the forest situation in Indonesia, unreported trade of raw logs remains a problem. We believe that, in the long term, continued efforts to curb illegal logging should help further support wood prices.

The Malaysian government has introduced legal measures and controls against illegal logging in Malaysia. The Forest Ordinance of Malaysia provides for penalties for the illegal collection of forest produce which include imprisonment and fines of up to ten times the value of the forest produce. Enforcement is carried out by the officers from the Sarawak Forest Department who work together with the police and the army to curb illegal logging, forest encroachment and timber theft. In Sarawak, all log sales must be approved by STIDC and Sarawak Forestry Corporation to ensure that royalties have been paid and that the annual quota and the percentages of logs allocated for export, where applicable, are complied with. All logs for export must be declared through customs and a certificate of country of origin is issued to ensure that the logs have come from legal sources. All timber concession holders must appoint only logging operators registered with the Sarawak Forest Department.

In Guyana, under the Forest Act, the Guyana Forestry Commission has implemented a system to deal with illegal logging either through court proceedings or adjudication outside the court, with a range of penalties including fines based on the equipment involved and the market value of the forest produce seized. The Guyana Forestry Commission has also implemented a log tracking system since 2000 which gives them more control over the harvesting and removal of timber. The tracking system regulates the volumes allowed to be logged, provides unique tag numbers to concession holders for logging, authenticates timber for removal and provides a tracking system back to the stump of origin for each piece of log arriving at market. The export of wood products from Guyana is also regulated by the Guyana Forestry Commission in collaboration with the customs department which approves all wood products for export.

According to the New Zealand Ministry of Agriculture and Forestry, illegal logging is not common in New Zealand. New Zealand timber is harvested and processed according to the local environmental laws. The New Zealand Ministry of Agriculture and Forestry’s Indigenous Forestry Unit monitors and enforces compliance with the Forests Act, which was amended in 1993 to end clear felling of indigenous forest and logging on the conservation estate, and to require that all indigenous forestry occurs according to a sustainable management plan or permit. Occasionally, illegal logging of indigenous forests does occur, and is usually prosecuted.

China has implemented penalties to curb illegal logging and, in some cases, criminal liability may arise. The penalties include the payment of compensation for the losses, an order by the competent department of forestry to plant ten times the number of trees logged, the confiscation of trees logged or the gains from their sale, and fines based on the value of the trees logged depending on the circumstances.

**THE TROPICAL LOG AND WOOD PRODUCTS MARKET**

**Production of tropical logs, plywood and veneer**

With the recognition of the importance of sustainable forest management and recent efforts to control the rate of deforestation with the imposition of logging bans, production of tropical logs, plywood and veneer has remained relatively stable in the last few years.

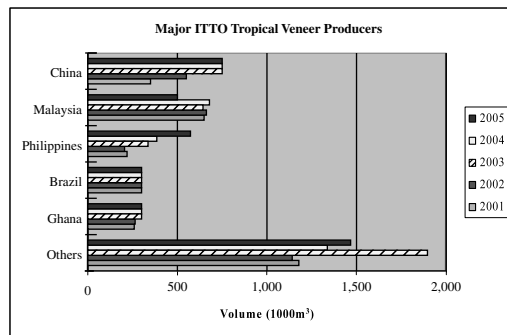
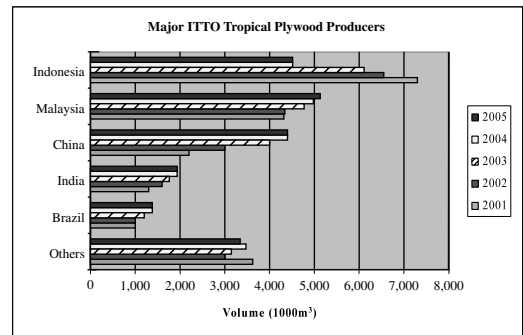
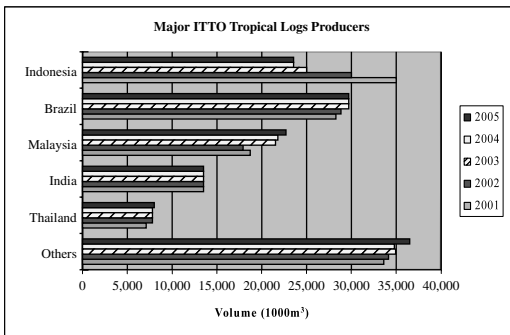
The following diagram illustrates the level of production of tropical logs, plywood and veneer by ITTO member countries between 2001 and 2005:

	<b>Production by ITTO member countries (1,000 m<sup>3</sup>)</b>				
	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Logs .....	136,192	132,189	132,463	131,134	133,954
Plywood .....	19,740	19,492	20,989	20,679	20,703
Veneer .....	2,955	3,122	4,225	3,751	3,891

Source: ITTO

Note: Figures reflect the official reported volumes and do not reflect the impact of illegal logging.

The following charts show the production of tropical logs, plywood and veneer amongst certain ITTO member countries between 2001 and 2005:



Source: ITTO

Note: Figures reflect the official reported volumes and do not reflect the impact of illegal logging.

According to the FAO, wood processing capacity in the Asia-Pacific region has increased significantly over the past 30 years, matching major increases in consumption of wood products in the region. Pöyry expects demand for forest products in the Asia-Pacific region to continue to increase, and to exceed that available from the region's forest resources, thus perpetuating the need to continue to import forest products. The increase in regional demand is expected to be met by imports of finished products as well as stimulate the expansion of local wood processing industries in the region, which will rely on external sources.

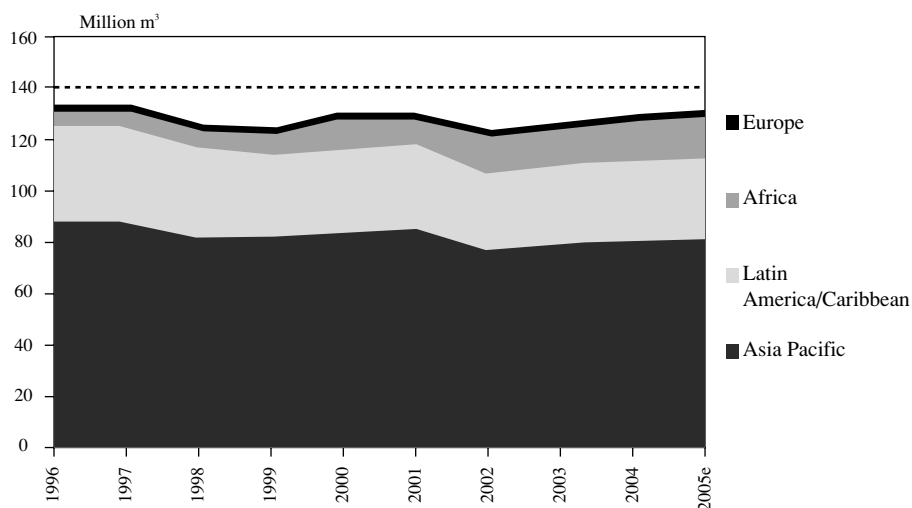
According to ITTO, housing starts are a major determinant of wood demand in most markets, and statistics on housing starts serve as a good indicator of demand for wood products for construction, joinery and furniture and fittings. In North America and the European Union, the United Nation Economic Commission for Europe (UNECE) reported that forest products markets climbed slowly to record levels in 2005 as demand from United States housing and European construction stimulated production and trade. However, UNECE expected rising mortgage rates in the United States to dampen housing construction in 2006. In the Asia Pacific region, according to ITTO, China's housing policy is changing to encourage private ownership over state-sponsored accommodations, with potential implications for housing starts and wood demand, although timber-framed houses currently represent a small fraction of Chinese housing starts. It has also been reported that plywood prices in Japan to have been depressed due to a weak housing market in Japan and Pöyry anticipates that the long-term outlook in Japan is for declining housing starts which is likely to constrain demand growth. However, data available indicates housing starts in Japan have risen since 2003 and we expect this level to be sustained in the near term along with an economic recovery in Japan.

**Tropical hardwood logs**

Between 1996 and 2005, demand for tropical hardwood logs was relatively stable. The Asia-Pacific region is by far the largest consumer of logs, consuming around 59% of the total global market. Other regions such as South America and Africa are also important consumption regions, with demand met mainly by local supply. Europe is also an important market, especially in terms of high quality logs.

The following table illustrates global tropical hardwood log consumption by region between 1996 and 2005.

**Global Tropical Hardwood Log Consumption**



Source: Pöyry

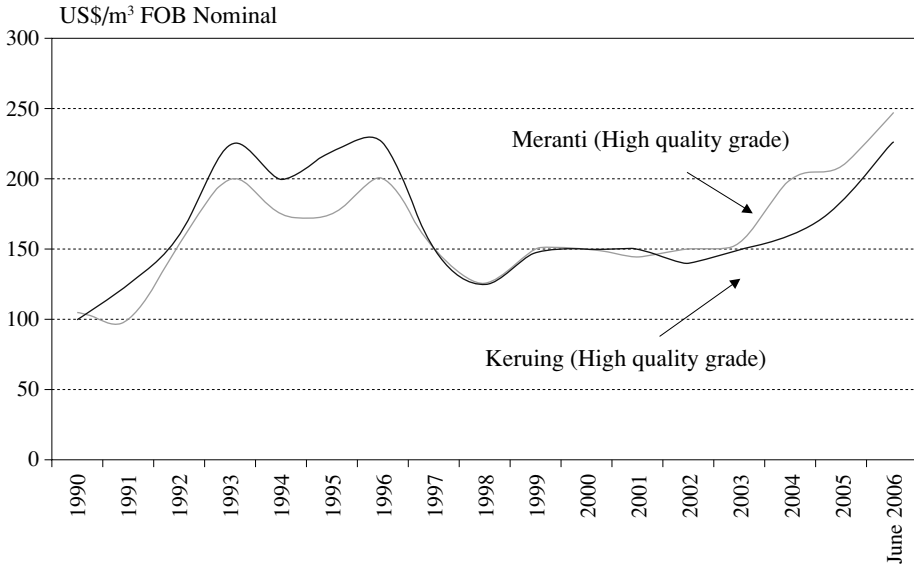
Note: e denotes estimated figures

Within the Asia-Pacific region, Japan and China are the largest single markets. However, these countries are experiencing very different trends: China, with rapid growth in demand, is driven by increased wood processing capacity, in contrast to Japan’s decline in demand as uncompetitive processing capacity is shut down. In addition, domestic plywood manufacturers in Japan have switched to using more softwood logs to reduce costs in response to higher tropical log prices. There has also been a recent trend of outsourcing plywood manufacturing operations to manufacturers outside of Japan. However, according to Pöyry, Japan still represents an important market, accounting for approximately 11% of traded tropical hardwood logs within the region. Closure of local wood processing capacity in Japan, while negative for log exports, is positive for the importation of finished products, such as plywood, veneer and sawn timber into Japan. Taiwan is also an important market for logs, due to its large wood processing capacity, and very limited forest resources.

As a result of declining demand in Japan, balanced with increasing demand in China and India, overall demand for Asia-Pacific tropical hardwood logs remained relatively stable between 2002 and 2004. China’s imports of hardwood logs in particular have increased five-fold over the past decade, driven mainly by economic growth and partly by restrictions imposed during 1998 by the Chinese Government on harvesting from Chinese natural forests.

Prices for tropical hardwood logs reached historical peaks in the mid-1990s, but declined significantly during the Asian financial crisis in 1997 and 1998 as a result of a drop in demand due to the economic downturn. Since 2000, log prices have been moving upwards, with notable increases in prices over the last three years. This reflects a strong demand for raw materials from China and a tight supply environment for logs. Prices for Malaysian logs have benefited from the declining Indonesian log exports and the export ban initiated in 2001. According to Pöyry, nominal prices for selected log grades and species have increased by as much as 65%, or close to 10.5% per annum since 2002, as a result of these supply constraints. The chart below illustrates the historical export log prices for selected Malaysia Keruing and Meranti logs.

**Malaysia Keruing and Meranti Historical Export Log Prices**



Source: Pöyry

According to International Monetary Fund (IMF) forecasts issued in September 2006, real GDP for developing countries in Asia is expected to grow by an average of 8.7% and 8.6% in 2006 and 2007, respectively, although real GDP for Japan is only forecast to grow by 2.7% in 2006 and 2.1% in 2007, respectively. It is expected that such projected positive economic growth in Asia would continue to support the demand for logs and wood products.

**Plywood and veneer**

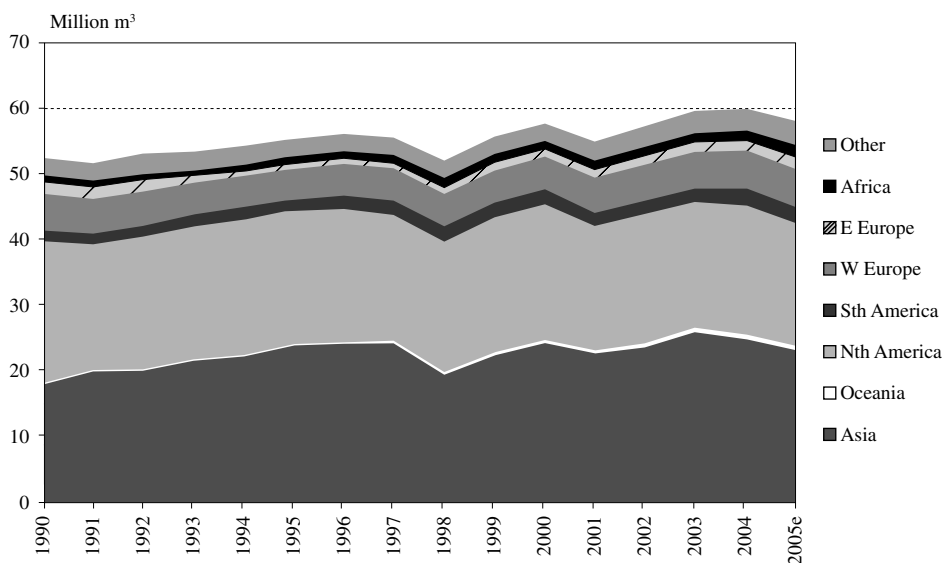
On a global basis, total plywood demand remained relatively flat between 1990 and 2005, amounting to close to 60 million m<sup>3</sup> in 2005. Plywood consumption in the Asia-Pacific region grew by a modest 1.8% per annum over the same period, representing around 40% of the global market, or 23 million m<sup>3</sup>, in 2005. In 2005, China and Japan accounted for 42% and 34%, respectively of total plywood demand in the Asia-Pacific region, dominating the tropical hardwood plywood markets. The United States also represents an important market for plywood. According to ITTO, the United States consumed 20.4 million m<sup>3</sup> of plywood in 2005 (of which 5.9 million m<sup>3</sup> was imported), whilst consumption increased slightly by 2.8% between 2001 and 2005. Plywood consumption is mainly driven by the construction and furniture industries.



Substitution by other types of wood panels such as MDF and particleboard has affected plywood demand. The price differential between plywood and MDF and particleboard has been a key factor in this substitution. Within the plywood segment, there has also been a substitution of tropical hardwood with softwood and temperate hardwood products to reduce costs. However, based on findings by Pöyry, in some end-use applications for tropical plywood such as film-faced plywood, floor-based plywood, marine plywood and container flooring grades, due to other materials being less suitable to meet the required performance criteria, there is a lower substitution threat.

The following table illustrates global plywood consumption by region between 1990 and 2005.

### Global Total Plywood Demand Development



Source: Pöyry

Note: e denotes estimated figures

As veneer is a component of plywood, market demand for veneer is affected by fluctuations in the market for plywood. Veneer tends to be produced as a separate product and transported or exported to an area more conducive to plywood production. As plywood production can be very labor intensive, in many cases veneer is exported to countries with lower labor rates such as the Philippines.

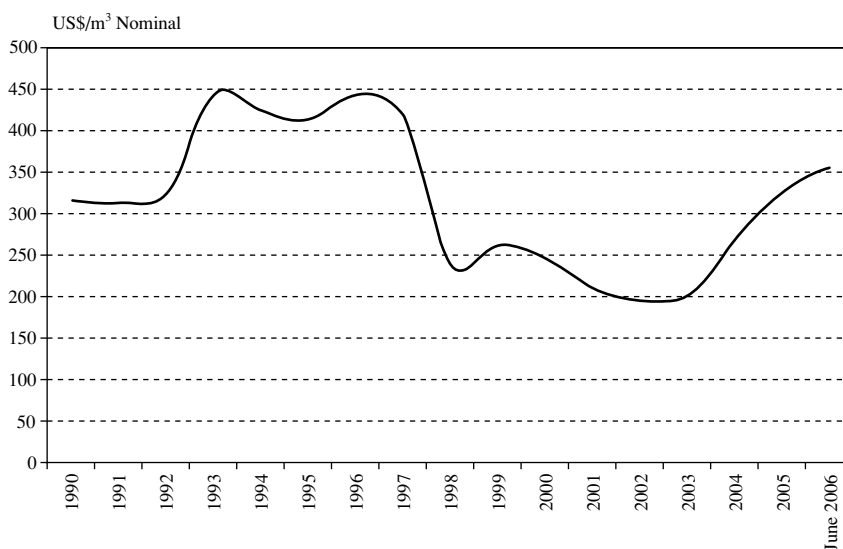
According to Pöyry, future demand growth for plywood in Asia is expected to remain relatively flat, with less substitution by other products. Improving living standards linked to increasing GDP implies increased volumes of plywood consumption in products such as flooring, interiors and furniture.

Despite the recent improvement in the economic conditions in Japan, Pöyry anticipates that the long-term outlook in Japan is for declining housing starts which is likely to constrain demand growth. However, we expect the recent rise in housing starts in Japan to be sustained in the near-term along with an economic recovery in Japan. According to Pöyry, strong economic growth, an expanding furniture industry and anticipated

continuing housing construction activity in China are some of the factors that will support plywood demand. China's export oriented furniture industry has also been expanding and significant capacity investments have occurred in the industry.

Plywood prices increased significantly as a result of rapid increase in demand in the early 1990s (between 1990 and 1993), but fell sharply during the Asian financial crisis. Prices have stabilized from 2000 onwards, and since 2003, there has been a clear upward trend as a result of some growth in demand within the Asia-Pacific region. Plywood prices in Asia have also been affected by increasing tropical log costs resulting from tightening tropical log supply. As a result, plywood prices in Asia have increased by over US\$150 per m<sup>3</sup>, representing an increase of 16% per annum, since 2003, according to Pöyry. The chart below illustrates the historical plywood prices for Malaysian and Indonesian plywood.

**Malaysia and Indonesia — Historical Plywood Prices**



Source: Pöyry

**Housing Products**

*Furniture*

On a global basis, trade in furniture has grown significantly between 2000 and 2004, with the European Union and the United States accounting for 75% of global consumption. Imports of wooden furniture have been particularly strong in the United States with annual growth of 15% per annum over the last decade, five times the growth of sales from domestic production. In the Asia-Pacific region, China is the largest producer followed by Japan.

### *Flooring*

The North American market experienced strong growth in hardwood and laminated flooring in the past few years. Demand for wood-based flooring in the Asia-Pacific region, particularly in countries such as China and India, has also been expanding due to an increase in construction activity.

### **Other products**

#### *Reconstituted Panel Products*

According to ITTO, substantial quantities of reconstituted panel products, particularly particleboard and MDF, are now being produced in several countries in Asia and Latin America. We believe that these products will become increasingly important as limits on the growth of plywood production are reached and as more countries move further into downstream processing and attempt to utilize available resources more efficiently. They may also substitute for plywood and sawn timber, resulting in decreasing or slower growth in production and exports of traditional tropical wood products in many countries.

#### *Sawn timber*

According to Pöyry, global demand for sawn timber has been growing steadily at a moderate growth rate of 0.7% per annum between 1995 and 2005. However, since 2002, demand has stabilized and increased and Pöyry expects the Asia-Pacific region to have a positive outlook with the continued upswing in the economies of importing countries and the strong construction industry prospects in China and India. The construction and furniture industries are the major demand drivers for tropical hardwood sawn timber products.

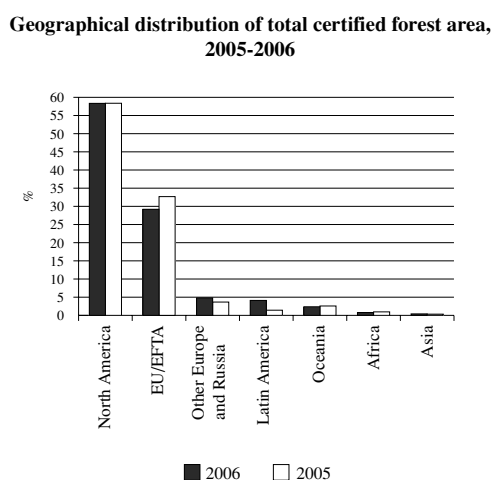
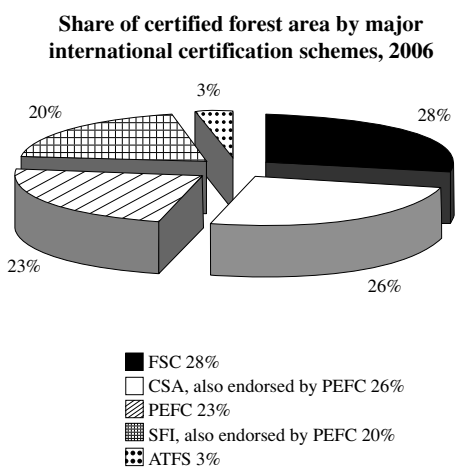
## **CERTIFICATION AND SUSTAINABLE FOREST MANAGEMENT**

With the increasing emphasis on sustainable forest development, forest certification has become a market-driven tool. According to the FAO, the percentage of world-wide certified forest has increased significantly since 1998, from less than 12 million hectares in 1998 to approximately 270 million hectares by May 2006, and there has been an increasing trend in demand for certified wood products in North America, Europe and Japan. FAO has reported that FSC-certified forest products from tropical forests, for instance, are increasingly appearing in retail and supermarket chains selling garden furniture from tropical forests in western and central Europe, including the United Kingdom. According to the FAO, the potential supply of logs from the world's certified forests in 2006 is estimated at approximately 370 million m<sup>3</sup>, an increase of approximately 8% from 2005 representing approximately 25% of the world's production of industrial roundwood logs. Two components of forest certification, forest management certification and chain of custody certification, provide assurance regarding the origin of the wood and its compliance with environmental management and other standards set out in the certification standard.

Although forest certification is voluntary, we expect that forest certification will enhance market access for wood products in environmentally-sensitive markets such as Europe and the United States. As a consequence, in conjunction with the increasing awareness of environmental issues and public relations, we believe that the area of forests being certified will continue to grow in the foreseeable future.

Forestry operations in many countries are now seeking some form of certification, either through the Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification Schemes (PEFC), or via other avenues (for example, ISO14000 and other national standards authorities). The FSC, in particular, has been recognized as one of the international organizations that provides a system for different stakeholders interested in forest issues to work towards responsible forest management. The PEFC Council is another international organization which promotes responsible forest management through independent third party certification, although its focus has been on forest certification in European and North American regions. Other certification schemes, such as the Canadian Standards Association (CSA) system, the Sustainable Forestry Initiative (SFI) in North America and the American Tree Farm System (ATFS) in the United States have also become more common in recent years in their respective countries.

The following charts show the share of certified area by major certificate schemes and the area of certified forest as a percentage of total forest area, by percentages, in 2006:



Source: Forest Products Annual Market Review 2005-2006, jointly published by FAO and the United Nations Economic Commission for Europe (UNECE)

According to the FAO, worldwide certified forest area reached approximately 270 million hectares by May 2006, representing approximately 7% of the world’s forest area, with approximately 58% of the world’s certified forest area being located in North America and approximately 29% in the European Union. In addition, FAO also reported that chain of custody (CoC) certificates issued by major international certification schemes increased by about one third, reaching 7,200 certificates worldwide by mid-2006, covered by PEFC and the FSC. Meanwhile, tropical countries are also increasingly developing their own national certification schemes. In Malaysia, for instance, the MTCC was established as an independent non-profit organization in October 1998 to create and operate a national forest certification scheme. These national certification schemes are usually catered to the criteria of the nations concerned.

## **FORESTRY INDUSTRY**

### **Malaysia**

According to the FAO, forest land in Malaysia is estimated to be 20.9 million hectares or 63.6% of its land area at the end of 2005. Of this, an area of 14 million hectares has been designated as permanent forest estate, which is under sustainable management. Approximately 11 million hectares of the permanent forest estate are production forests with the remaining 3 million hectares being protection forests. Malaysia also has 5 million hectares of perennial agricultural tree crops which are mainly rubberwood, oil palm, cocoa and coconut.

Malaysia was the world's largest tropical log exporting nation in 2005. Sarawak is the most important timber producing state of Malaysia, although timber production has been reduced to meet the sustainable level recommended by ITTO. According to the Malaysia Timber Council (MTC), export of major timber products from Sarawak accounted for approximately 34.9% of all timber product exports from Malaysia in 2005. Over 60 species of timber are regularly extracted in Malaysia, and the prime commercial species groups include meranti, kapur, keruing, selangan batu, bindang, merbau, cengal, balau and mixed light hardwood.

According to the Department of Statistics of Malaysia, total export of timber and timber products in 2005 was valued at approximately US\$5.9 billion, or 4.0% of the country's total export earnings. The country's reliance on logs for export earnings is slowly being reduced in favor of semi-processed and finished goods, with sawn timber, plywood, veneer products and furniture increasing in exports, in terms of both volume and value.

The importance of forest plantation development to augment the supplies of logs from the natural forests is recognized by both the Sarawak state government and the private sector in Malaysia. The Sarawak state government has set a target to establish around 1.4 million hectares of plantation in the next 20 years. However, at present, private sector investment in forest plantations has yet to materialize in a significant manner.

### **Guyana**

The forests of Guyana cover approximately 15.1 million hectares or 76.7% of the country's total land area as at 2005. According to ITTO, approximately 13.6 million hectares have been classified as state forest and may be considered potential production forest. Of these, 5.8 million hectares are allocated to commercial use, 500,000 hectares to research and protection and 63,000 hectares are protected and outside the jurisdiction of the forest service. State Forests are allocated by the Guyana Forestry Commission to timber harvesting concessions, which are allocated under three categories based on area and duration: State Forest Permissions (annual permits), Wood Cutting Leases (three to 10 years) and Timber Sales Agreements (20 years or more). Approximately 7 million hectares (or 56% of the state forest), mainly in the south of the country, have not yet been allocated to timber harvesting or other uses; a lack of ready access and long distances to market make the commercial harvesting of these forests uneconomical at present.

## **New Zealand**

Forestry is a major industry in New Zealand. It ranks as the third largest commodity export industry, behind dairying and meat production, and contributed approximately 11% of the country's export earnings in 2005. New Zealand is also a leading forest plantation country. Its planted production forests covered an estimated 1.81 million hectares as at April 1, 2005. Radiata pine is the dominant species, making up 89% of the planted forest area in New Zealand, with douglas-fir the next most common species, making up 6%. Almost all of New Zealand's industrial roundwood is produced in plantations for domestic use and for export.

Since 1987, New Zealand has implemented a comprehensive plantation privatization program and has sold around 540,000 hectares of plantation forests to private sector interests. As a result, more than 90% of the planted forests are now under private ownership. The rate of new planting fluctuates from time to time, reaching a high of 98,200 hectares in 1994, but has since declined to 19,900 hectares in 2003 and further declined to 10,600 hectares in 2004, to a more stable level following the decline in log prices during the Asian financial crisis. Significant areas of forest established in the 1970s are now maturing and are expected to be harvested over the next decade.

## **INTERNATIONAL BODIES AND ORGANIZATIONS IN THE GLOBAL FORESTRY INDUSTRY**

International bodies and organizations such as the Food and Agriculture Organization of the United Nations (FAO) and International Tropical Timber Organization (ITTO) issue statistical data, information and commentary in relation to the global forestry industry from time to time.

### **FAO**

Serving both developed and developing countries, FAO acts as a neutral forum where all nations negotiate agreements and debate policy. It collects, analyses and disseminates data to aid development and keeps a comprehensive database on forestry information for countries worldwide. It helps developing countries and countries in transition to modernize and improve agriculture, forestry and fisheries practices. The FAO has a Committee on Forestry which brings together heads of forest services and other senior government officials worldwide to identify emerging policy and technical issues, to seek solutions and to formulate proposals for appropriate actions.

### **ITTO**

ITTO is an intergovernmental organization headquartered in Japan which promotes the conservation and sustainable management, use and trade of tropical forest resources. ITTO collects, analyzes and disseminates data on the production and trade of tropical timber, develops policy documents to promote sustainable forest management and forest conservation and assists tropical member countries to adapt such policies to local circumstances and to implement them in the field through projects. The data collected by ITTO is based on estimated figures by individual countries due to the lack of reliable official production figures provided by ITTO members.

*ITTO member States*

ITTO currently has 59 member States which cover approximately 80% of the world's tropical forests and represent about 90% of the global tropical timber trade. ITTO membership is open to the governments of all States, subject to approval by the ITTO council but without any specific criteria. The 59 member States of ITTO are:

**Producing countries (based on ITTO classification)**

*Africa*

Cameroon	Central African Republic	Congo	Côte d'Ivoire
Gabon	Ghana	Liberia	Nigeria
Togo	Democratic Republic of the Congo		

*Asia & Pacific*

Cambodia	Fiji	India	Indonesia
Malaysia	Myanmar	Papua New Guinea	Philippines
Thailand	Vanuatu		

*Latin America*

Bolivia	Brazil	Colombia	Ecuador
Guatemala	Guyana	Honduras	Mexico
Panama	Peru	Suriname	Trinidad and Tobago
Venezuela			

**Consuming countries (based on ITTO classification)**

Australia	Canada	China	Egypt
European Union	Austria	Belgium/Luxembourg	Denmark
Finland	France	Germany	Greece
Ireland	Italy	Netherlands	Portugal
Spain	Sweden	United Kingdom	Japan
Nepal	New Zealand	Norway	Republic of Korea
Switzerland	United States of America		

*ITTO guidelines*

The criteria and indicators has been developed by ITTO as part of its guidelines to define, assess and monitor progress towards sustainable forest management. The ITTO criteria and indicators list the main factors that influence the health and productivity of a forest and suggest indicators that, if measured over time, will help managers assess the extent to which management practices are consistent with the sustainability of forests and of forest-dependent communities. The ITTO criteria and indicators are reviewed and refined from time to time based on experience and seek to reflect new concepts of sustainable forest management.

The ITTO criteria and indicators specify seven criteria as essential elements of sustainable forest management. The first criteria, “Enabling conditions for sustainable forest management”, is concerned with the general legal, economic and institutional framework, without which actions included under the other criteria will not succeed. The second and third criteria, “Extent and condition of forests” and “Forest ecosystem health” respectively, are concerned with the quantity, security and quality of forest resources. The remaining four criteria deal with the various goods and services provided by the forest, including “Forest production”, “Biological diversity”, “Soil and water protection” and “Economic, social and cultural aspects”. Each criteria has a set of specified indicators to identify information needed to monitor change, both in the forest itself (outcome indicators) and as part of the environmental and forest management systems used (input and process indicators).

### **HARVEST CYCLES, CLIMATE CONDITIONS AND HAZARDS**

Harvest cycles vary globally depending on the location, species, growth rates and end product use of the logs. Plantation logs often have an optimum time for harvesting given that they are grown in a controlled environment with silviculture techniques applied. The harvesting cycle may also vary depending on the proposed end use for the wood. For natural forests, individual government bodies in the relevant countries, such as Guyana and Malaysia, often have overall control of the concessions and regulate the permitted harvest cycles or cutting levels as part of their commitments towards sustainable forest management. In Malaysia, concession holders are required to harvest logs according to a cutting cycle of 25 years, whereas in Guyana, the cutting cycle is 40 years. They may also prescribe the diameter that the trees must attain before logs can be harvested. These requirements are often determined following studies conducted in relation to growth rates and having regard to sustainable forest management practices.

Tree species are grown depending on climate conditions and weather. These are most notable in natural forests where the species vary according to climate, sunlight, rainfall, soil conditions and elevations. Tropical forests are found near the hot and moist equatorial zone and are home to a variety of tropical hardwood species such as meranti, kapur, keruing and selangan batu as well as tropical softwood species such as bindang. Temperate forests take shape in the higher latitudes, which enjoy warm moist summers and cold and snowy winters, where temperate hardwood species such as eucalyptus, birch, aspen, alder, maple, beech and oak, and temperate softwood species such as radiata pine, douglas-fir, spruce, hemlock and cedar are grown. The boreal forest, where giant conifers such as spruce, pine and fir grow, are found in the colder northern latitudes of North America, Europe and Asia, where there is heavy snow in the winter. For forest plantations, on the other hand, species are selected for planting based on the climate, soil conditions, expected growth rates and the end product to be produced. In selecting the appropriate species, considerable analysis is often done to determine growth rates and end product utilization with respect to climate and soil conditions as well as resistance to insect and disease infestation.

Growth of trees in both natural forests and plantations can also be affected by natural hazards as well as unfavorable local and global weather conditions, such as drought, floods, hailstorms, windstorms, typhoons, land slides, frost and winter freezing; and natural disasters such as fire, disease, landslides, insect infestation, pests and earthquakes. The hazards that are prevalent in the forests differ depending on the geographical location of the forests and whether the forests are natural or man-made plantations. Natural forests in Malaysia and Guyana, for instance, are more susceptible to drought, floods and land slides. Plantations in Malaysia and New Zealand, on the other hand, are more vulnerable to wind, fire, pests and diseases.