Summary

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1 Forest resources

Of the land area in Finland, 86% or 26.3 million ha is classified as *forestry land*. Based on site productivity, forestry land is divided into *forest land* (20.1 million ha), *scrub land* (2.7 million ha) and *waste land* (3.3 million ha of treeless or almost treeless land). In addition, forestry land also includes 0.2 million ha of *forest roads, timber depots*, etc. The national definitions of the forestry land categories are as follows:

- *Forest land*: the potential annual average increment of the growing stock is at least 1.0 m³/ha.
- *Scrub land*: the potential annual average increment of the growing stock is less than 1.0 m³/ha, but at least 0.1 m³/ha.
- *Waste land*: the potential annual average increment of the growing stock is less than 0.1 m³/ha.

FAO's definition of forest differs from the Finnish national classification. According to FAO, almost all forest land and most of the scrubland in Finland would be considered forest land.

Of the total forestry land in Finland, 52% is under *non-industrial, private ownership*; the *state* owns 35% and *forest industry companies* own 8%. The remaining 5% represents forests under municipal, parish, shared or joint ownership. State-owned forests are mainly situated in northern Finland. The state also owns extensive nature conservation and wilderness areas, most of which are located in northern Finland. In this year, the focal forest resource statistics were published also by forest vegetation zones. In Finland, 98% of forestry land belongs to the *boreal forest vegetation zone*, which is further divided into *southern boreal* (29% of forestry land), *middle boreal* (34%), and *northern boreal* (34%) zones. The growth conditions deteriorate sharply from south to north in Finland.

The majority of the Finnish stands grow on areas classified as forest or scrub land. The volume of the growing stock is marginal on scrub land, so practically all forestry activities take place on forest land. The essential forestry statistics (growing stock volume, increment, etc.) are presented for forest and scrub land stands (or merely for forest land stands). The total area of forest and scrub land in Finland amounts to 22.8 million ha, of which 89% is *available for wood supply*.

The *growing stock volume* in Finland amounts to 2 206 million m³ (over bark). Since the 1970s, the standing volume has continuously risen and is now 45% higher than three decades ago. Half of the growing stock volume consists of Scots pine, 30% Norway spruce, and 20% broadleaves (mainly birch). The proportion of pine has increased and that of spruce has decreased. The proportion of growing stock on mires is 23%. Draining of mires has improved the growing conditions for trees on peatlands, and hence the importance of growing stocks on mires is increasing. Of the total growing stock volume, 92% grows in forests available for wood supply or under restricted forestry use.

The *annual increment of the growing stock* in Finland is 100 million m³; this is an increase of 74% since the 1970s. The increment consists of 48% for pine, 30% for spruce and 22% for broadleaves. The main contribution to the rise in increment is from pine, due to the large number of young stands at the rapid growth stage. The increment of broadleaves has also clearly risen, but that of spruce has only risen slightly. Of the increment, 97% is in forests available for wood supply.

Since the 1970s, the *total drain* (removals + natural drain) has continuously remained lower than the volume increment of the growing stock. Because of the economic recession, the total drain of stemwood decreased to 60 million m³ in 2009. The drain amounted to only 62% of the annual increment of the growing stock available for wood supply. The drain was lower than the increment

in all regions and in all major tree species. Of the total drain, 38% was pine, 32% spruce, and 30% broadleaves. In 2009, the difference between increment and drain was the largest in pine (25 mill. m³). A major part of the pine- and broadleaved-dominated stands are young stands with rapid growth, but the potential removal is less than the increment. In recent years, the spruce drain has represented a markedly higher proportion of the total drain than the proportion of spruce in increment and volume of the growing stock, and mature spruce stands have been abundant amongst our spruce stands.

Statistics on forest resources in Finland are based on the National Forest Inventories (NFIs), which were started in the 1920s. The most recent forest resources data is based on the field measurements obtained during the 10th National Forest Inventory performed over 2004–2008.

2 Forest biodiversity and health

Biodiversity in the forest signifies the abundance and versatility of different forest environment types, organism communities and ecosystems, as well as the variety of species living in forests and their genetic heredity. Measures to conserve forest biodiversity include establishing protected areas, protecting valuable habitats to save threatened species, and taking into consideration the goals of biodiversity in forestry. Protecting biodiversity in forests is one of the main goals of Finnish forest and environmental policies. It is the basis for the essential policies applied in controlling protection and use of forests and the related legislation and recommendations.

In Finland, there are 4.8 million hectares of protected forests and areas under restricted forestry use, of which the area of forests (i.e., forest and scrub land) amounts 3.0 million hectares. This represents 13% of the total forest area. Most of these areas are located in northern Finland, where they account for 22% of the forest area. Of the total forest area in Finland, 16% in northern Finland and 2% in southern Finland are strictly protected and unavailable as a source of wood supply.

In 2009, the total area of statutory nature conservation and wilderness areas on state-owned land was 2.8 million hectares. Conservation areas on private land totalled 0.2 million hectares. The nature conservation areas not yet established under the various nature conservation programmes totalled 0.6 million hectares or 16% of the total target area of all nature conservation programmes.

The range of methods available for maintaining biodiversity has become more diverse over recent years. In selecting new areas for protection, one of the methods applied has been the voluntary participation of forest owners and protection agreements made for fixed-term periods. In 2002–2007, a new forest biodiversity programme for southern Finland, the METSO Programme, was implemented. This programme was important as a trial of new voluntary means for non-industrial, private forest owners to increase biodiversity in their forests. During this pilot phase, more than 6,000 hectares of forests were protected. A new METSO programme for the period of 2008–2016 was launched in spring 2008.

When managing nature in conservation areas, the most important guideline is the continuation of natural processes. In previously established protected areas, some effects caused by human activities are being removed. For example, during 2009, various restoration procedures were carried out on more than 2 000 hectares of state-owned nature conservation areas. In total, the area of forest restoration on these areas in Finland amounts next to 31 000 hectares.

The quantity of decayed tree material can be considered to be among the most important indicators as to biodiversity in the forest. It has been estimated that in Finland there are approximately 4 000–5 000 species that are dependent on decayed and dead trees. This represents one-fifth of all species living in the forests. According to the data of the latest National Forest Inventory (NFI10), the volume of decayed and other dead trees has increased in the forests in southern Finland. On average, there is 3.3 m³ (mean volumes of the trunk part over 10 cm tree diameter) of decayed and other dead trees per hectare on forest land in southern Finland. In northern Finland, the corresponding volume is 9.0 m³ per hectare. The total volume of decayed and dead trees in Finland is 118 million m³.

The majority of Finland's forests are commercial forests. In accordance with establishing protection areas, the biodiversity of forests is also decisively affected by how the commercial forests are managed. In commercial forests, biodiversity is promoted, for example, by maintaining valuable habitats, increasing the amount of deadwood, and saving large broadleaves in cuttings. The main principles of nature management in Finland's forests are set out in the Nature Conservation Act and the Forest Act, as well as in Forest Certification Schemes and Forest Management Recommendations.

The latest assessment of threatened species in Finland was carried out over 1997–2000. Of the total of 43 000 species, 15 000 were known sufficiently to permit the assessment, and 1 505 of them were classified as threatened. Forests and mires were the primary habitat for 631 threatened species. The results of the next assessment will be published at the end of 2010. Moreover, the first assessment of habitat types in Finland was completed in 2008. According to the assessment, approximately two-thirds of the habitat types of forests were threatened. The barren mineral-soil sites as well as herb-rich hardwood sites in southern Finland were classified as extremely threatened.

Forest health is influenced by a combination of several factors, such as weather and soil conditions, age and quality of the forest, forest management, damage and air pollution. Damage to the forest is often caused by the interaction of environmental factors and damaging agents.

According to the data of the latest National Forest Inventory (NFI10), damage reducing the silvicultural quality of stands was observed on 4.7 million hectares of forest land available for wood supply, representing 21% of the forest land in southern Finland and 30% of that in northern Finland. The most significant causes of damage were weather factors and fungal diseases. In winter 2008–2009, an extremely large occurrence of voles damaged large areas of the seedling stands. The European pine sawflies (Neodiprion certifer) also caused needle damage in forests in southern and central Finland in 2009.

3 Silviculture

In 2009, the amounts of the most important silvicultural and forest improvement work decreased compared to the previous year, with the exception of ditch-cleaning and supplementary ditching. Forest regeneration was accomplished on 141 000 hectares in total; 18 000 hectares were regenerated naturally and 123 000 hectares artificially. Of the artificial regeneration area, the proportion of spruce was 55%, that of pine 42%, and the remaining 3% were other species. 95 000 hectares were planted and 27 000 hectares seeded. 177 million domestic seedlings were delivered for planting. In addition, 17 million seedlings were imported to Finland and 3.5 million seedlings were exported. Soil preparation was accomplished on 109 000 hectares. The area was 19% less than in the previous year and the smallest in thirty years.

The area of tending of seedling stands and improvement of young stands, totalling 257 000 hectares, was on the same level as in the previous year. Seedling stands were tended on 164 000 hectares, 114 000 hectares being situated in private forests. Although the harvesting of energy wood was buoyant, young stands were improved on 93 000 hectares, which is just 2% larger than in the previous year. Improvement of young stands is mainly carried out in private forests, and in 2009, this accounted for 89% of all improvement.

In 2009, the area covered by forest fertilisation was 46 000 hectares. In private forests, the area fertilised grew to 25 000 hectares. In the forests owned by the forest industries and the state, the area, mostly fertilised for growth, diminished by one-third to 21 000 hectares, of which 3 700 hectares was fertilised by ash. Old drained areas were cleaned by digging 19 000 kilometres of ditch on 69 000 hectares. The area was 7 000 hectares larger than in the previous year, due to increased ditch-cleaning in private forests. In 2009, 857 kilometres of new forest roads were constructed, half of which was accomplished in private forests. Basic improvement work was carried out on 3 273 kilometres of old forest roads, 1 887 kilometres in private forests and 1 387 kilometres in forests owned by the forest industries and the state.

The total area of timber fellings dropped by almost one-third from the previous year, to 470 000 hectares. The area was approximately 100 000 hectares less than the average of the ten previous years. In private forests, felling was carried out on 348 000 hectares. Regeneration fellings covered one-fifth of that, and intermediate fellings were done on the rest of the area. In the forests owned by the forest industries and the state, the area of intermediate fellings diminished by one-third to 80 000 hectares, but the area of regeneration fellings remained the same as in the previous year, 39 000 hectares.

In 2009, EUR 305 million were spent on silvicultural and forest improvement work, of which private forest owners spent EUR 224 million. The forest industry and the state spent EUR 31 million and EUR 50 million respectively. A quarter of the total amount was spent on artificial regeneration and one-fifth on tending of seedling stands. The state subsidy for securing wood production in private forests grew by EUR 16 million compared to the previous year, adding up to EUR 80 million. The biggest increase took place in the subsidy for harvesting and chipping energy wood, for which EUR 13 million was used compared to the EUR 5 million used in the previous year.

4 Roundwood markets

Roundwood market statistics are compiled in Finland on roundwood trade volumes, prices and removals. The statistics on roundwood purchases and prices refer to roundwood trade in non-industrial, private forests only. In addition to non-industrial private forests, the statistics on roundwood removals also include removals from forests owned by forest industry companies and the state.

In 2009, the roundwood markets were the slowest for 25 years. Because of the poor market situation and large stocks of timber, the roundwood trade was nearly at a standstill from February until August. By the end of the year, the rise in prices, together with the forthcoming split of the sales income tax relief, boosted the trade, so that over half of the year's sales were done in November–December. In total, the forest industries purchased 16.5 million m³ of roundwood from non-industrial, private forests. The volume decreased by 44% compared to the previous year. The trade in sawlogs declined by 31%, while the trade in pulpwood decreased by 53%.

In 2009, stumpage prices as well as delivery prices fell from the previous year's levels. The prices for birch logs decreased by 21%, and for softwood logs and spruce pulpwood the decrease was nearly 15%. The prices for pine and birch pulpwood also dropped over 10%. Delivery prices fell by 12–20% from the previous year.

In the first half of 2010, the roundwood trade recovered clearly, and by the end of August the forest industries had purchased 17 million m³ of roundwood. Stumpage prices rose by 15–20% from the January level. In the autumn the prices fell again, this time due to the storm damage which suddenly brought large amounts of roundwood to the market.

The 2009 commercial roundwood removals remained at 41.4 million m³, 20% less than in 2008. The quantity cut was the lowest since 1992. Imports of roundwood also decreased; only 9 million m³ of roundwood was imported, less than half of the imports of the year before. Commercial removals focused on pulpwood: 24.2 million m³ of pulpwood was cut from the forests in 2009. Removals of sawlogs were only 6.8 million m³.

The share of non-industrial, private forests of total commercial removals was 32.1 million m³ (78%). Removals from the forest industries' own forests were 4.3 million m³, and from the state forests 5.0 million m³.

5 Harvesting and transportation of roundwood

In 2009, commercial roundwood removals decreased by one-fifth from the previous year to 41.4 million m³. About 84% of this was harvested in state-owned forests or in standing sale fellings carried out by forest industries, and the remaining 16% in delivery sales in non-industrial, private forests. On average, 1 590 harvesters and 1 640 forwarders were used in the harvesting and transportation of roundwood. The number of harvesters decreased by 15% and that of forwarders by 19% from the previous year.

Timber fellings performed in state-owned forests or by the forest industries are almost completely mechanised: in 2009, the degree of mechanisation was over 99%. The unit costs of this mechanised roundwood harvesting amounted to EUR 10.44 per m³, which was at the same level as in 2008.

The main long-distance transportation method in Finland is road transportation by trucks. In 2009, 70% of the roundwood was delivered direct to the mills using timber trucks. Road transportation, on average about 50 km, is also used at the beginning of the transportation chain when roundwood is transferred to the mills by rail or waterways. On average, 1 120 timber lorries were employed in domestic roundwood transportation. In 2009, the mean transportation distance increased by 8% from the previous year to 171 km. In direct road transportation the mean distance was 109 km, in rail transportation 317 km, and in water transportation it was 315 km. The average unit cost of long-distance transportation was EUR 7.57 per m³, which was 2% less than in the previous year.

In 2009, the overhead costs of roundwood procurement was EUR 3.51 per m³. This was 11% more than in 2008.

In domestic road transportation, forest sector products comprised 15% of the total freight by road, while in rail transportation the proportion was 58%. The volume of imported roundwood and wood residues totalled 9.2 million m³, of which two-thirds originated from Russia. Of total wood imports, 36% was transported by water, 34% by rail and 31% by road. In 2009, exports of roundwood and forest industry products accounted for 44% of the freight exported from Finland. The forest sector

exports (total 16 million tons) decreased by 20% from the previous year. Over the last three years, the reduction has been 30%.

6 Multiple-use forestry

In Finland, forests represent a major material resource, as well as a recreational, aesthetic and cultural resource. Forests are also important in other, less tangible ways, such as carbon and biodiversity management.

In economic terms, the most important forest-based product is commercial wood. In 2009, production of industrial roundwood amounted to 41 million m³, which corresponds to EUR 1 130 million in stumpage price earnings. The value of household timber (1 million m³) was approximately EUR 40 million. Forests are also an increasingly important source of energy. The stumpage value of fuelwood (6 million m³) used by small-sized residential housing was almost EUR 60 million, and the mill price of Finnish forest chips (4 million m³) used in heating and power plants was EUR 160 million in 2009.

Forests represent an extremely important environment for various outdoor recreational activities, as well as a landscape factor supporting both mental and socio-economic well-being. The recreational use of forests in Finland is mainly based on the public right of access, which makes it possible to wander in the forests as well as pick wild berries and mushrooms virtually anywhere. Practically every Finn enjoys nature through activities like hiking, picking wild berries/mushrooms, or hunting. Adult Finns make approximately 600 million recreational visits per year to enjoy nature. The number of overnight visits to nature tourist destinations per year is about 14 million, and these figures account for 40 million travel days in total. It is estimated that actual nature tourism accounts for a quarter of all added value in Finnish tourism.

There are almost 40 edible species of wild berries in Finland, 16 of which are picked for food. The annual estimated harvest of berries is 500–1 000 million kg, of which 30–40% are acceptable for picking. In favourable years, the harvest of lingonberries and bilberries amounts to approximately 50 million kg, and the total of other wild berries accounts for 10 million kg. The majority are picked for private domestic use. In 2009, about 7 million kg of wild berries and 0.6 million kg of wild mushrooms were marketed. The earnings of wild berry and mushroom pickers amounted to EUR 11 million.

There are approximately 300 000 hunters in Finland, and three out of every four went hunting at least once during the year. In 2009, 62 000 moose and 26 000 white-tailed deer were bagged by hunters. Of all cervids, the total amount of meat obtained increased to 9.5 million kg, representing 88% of the total amount of game. The estimated monetary value of this 10.7 million kg of game meat totalled EUR 78 million.

Reindeer husbandry is a traditional and unique means of livelihood in northern Scandinavia. In Finland, the area of reindeer husbandry is more than one-third of the total area of Finland, and the number of reindeer owners is approximately 4 600. During autumn and winter 2009, 105 000 reindeer were culled. This produced 2.4 million kg of meat with a total value of EUR 17 million. The size of the winter herd after culling was about 200 000 reindeer.

7 Forest sector labour force

Due to the global recession, the employment rate in Finland declined during 2009. In the national economy total, the average number of employed persons decreased by 3% from 2008 to 2.46 million persons. The unemployment rate rose for the first time since 1994 and ended up at 8.2%.

The number of employed persons in the forest sector decreased significantly during 2009. Forestry and forest industries together provided work for only 70 000 persons, corresponding to less than 3% of total employment. Of the forest sector labour force, 67% or 47 000 persons worked within the forest industries, while the remaining 23 000 were employed in various forestry activities.

The average unemployment rate of 8.0% within the forest sector increased from the previous year's level, and was equal to the average of all industries (8.2%).

The downward trend in the forest sector labour force is mostly due to labour force reductions in the forest industries. In contrast, the employment figures in forestry have been been quite stable since the end of the 1990s. New work opportunities have become available for forestry workers, for example, in the harvesting of energywood and in some silvicultural operations. In 2009, approximately two-thirds of employed persons in forestry were wage and salary earners, whilst one-third consisted of self-employed entrepreneurs and forest owners involved in wood harvesting and silvicultural work in their own forests.

In 2009, the number of people employed by the forest industries was one-third lower than during the 1990s on average. Compared to 2008, the fall in employment was

20%. Finnish forest industries are currently undergoing substantial structural changes, resulting in capacity reductions and hence fewer jobs, especially in the pulp and paper industries. The latter employed 21 000 persons in 2009, a decrease of 22% from the preceding year. In the wood-products industries, employment fell by 16% to 26 000 persons. Within this sector, small and medium-sized companies play an important role especially in sparsely inhabited rural areas. About half the total labour force in the wood-products industries was employed by the carpentry and joinery industry, which mainly supplies domestic markets.

In 2010, the average earnings of felling workers at nominal value was EUR 13 per hour. The corresponding statistics in the forest industries are from 2009. In the wood-products industries, the average hourly earnings amounted to EUR 16 (5% increase from 2008), and in the pulp and paper industries they were EUR 21 (+4%). Across all branches of manufacturing, the average annual rise was 6%.

With reference to labour disputes, only six were reported in the pulp and paper industries in 2009. In 2008, the number of accidents at work in the forest sector decreased by 11% from the year before. A total of 3 300 accidents at work were registered in the forest sector, and more than two-thirds of these occurred in the wood-products industries.

8 Wood consumption

In 2009, roundwood consumption in Finland totalled 59.5 mill. m³. Consumption has now declined three years running, from the previous year more than 13 mill. m³ (–18%) and no less than 22 mill. m³ (–27%) from the top volumes achieved in 2006.

Almost 90% of the roundwood, or 51.5 mill. m³, was consumed by the forest industries. The rest – around 8.0 mill. m³ – was burnt for energy generation in heating and power plants and in small-sized residential housing. Wood consumption in energy generation is presented in more detail in Chapter 9, Energy.

In 2009, roundwood consumption by the forest industries was the lowest since the beginning of the 1990s, declining 14.8 mill. m³ or 22% compared to the previous year. This reduction resulted from the global recession, which decimated the demand for forest industry products in Finland's main marketing areas. Of the branches of forest industry, the most important consumers were the sawmilling and chemical pulp industry. Sawmilling consumed 18.4 mill. m³ of roundwood – 17% less than in the previous year and almost 10 mill. m³ less than in average in the 2000s. The consumption in the chemical pulp industry was 23.1 mill. m³, approx. 45% of the total consumption of the forest industries. The volume fell by almost a quarter compared to that of a year before and approx. 6 mill. m³ compared to the average in the 2000s.

The most important roundwood assortments consumed were pine pulpwood (11.9 mill. m³) and hardwood pulpwood (10.5 mill. m³). The consumption of spruce logs as well as pine pulpwood decreased the most, both by more than 3 mill. m³ or one-fifth compared to the previous year.

The consumption of domestic roundwood totalled 44.2 mill. m³, 7.4 mill. m³ or 14% less than in the previous year. The consumption of imported roundwood was 7.3 mill. m³, approximately half of the previous year's consumption. The share of imported roundwood from the total consumption was 14% compared to the average of 22% in the 2000s. This reduction was, in addition to decreased demand, mainly influenced by the intended increase in import taxes set by the most important importer, Russia. As a consequence of this, the Finnish forest industries have considerably reduced their roundwood procurement in Russia.

In addition to roundwood, the forest industries used 6.4 mill. m³ of sawmill chips and dust originating from the sawmilling and plywood industries. This assortment was mainly consumed by the chemical and mechanical pulp industries: in both branches, the consumption of sawmill chips and dust was close to one-fifth of total wood consumption. Additionally, in 2009 the paper and paperboard industries consumed 0.5 mill. m.t. of recovered fibre for raw material (see Table 10.5). The consumption of saw and cutter dust for the manufacture of wooden pellets was 0.6 mill. m³. The volume of exported wood was 1.2 mill. m³.

9 Energy

Energy consumption per capita in Finland is one of the highest among the European Union countries. Almost half of the total energy consumed in the 2000s was generated from fossil fuels, with the proportion of renewables approx. a quarter. The proportion of imported energy sources has been 70% on average.

In 2009, total energy consumption in Finland reached 1 336 petajoules (PJ), which was 6% less than that of the previous year. Consumption has now declined

three years running as a result of decreased industrial production caused by the global recession. Compared to the previous year, the greatest increase occurred in the consumption of coal (+12 PJ), whereas the consumption of wood fuels (–36 PJ), hydro power (–16 PJ) and peat (–12 PJ) decreased relatively the most. The most important energy sources in 2009 were oil products, also including oil consumed by transportation, which made up approximately a quarter (334 PJ) of the total.

For the compilation of statistics, wood fuels are divided into black liquor and other concentrated liquors produced by pulp industries, as well as into solid wood fuels. Solid wood fuels can further be divided into wood fuels consumed by heating and power plants (in industry and energy generation) and into small-scale combustion of wood, which includes fuelwood consumed by small-sized residential housing (i.e., private houses, farms and holiday homes) as well as commercial and office buildings. In addition, small volumes of other forest industry by-products and waste products (e.g. pine and birch oil, methanol, biosuspensions and paper) are consumed.

In spite of the decrease of 36 PJ or 12%, wood fuels covered one-fifth (266 PJ) of total energy consumption in Finland, and they are the second most important source of energy after oil products. According to the Forest Accounts by Statistics Finland, almost half of all the wood consumed in Finland is used in energy generation. Wood fuels also account for approx. 80% of all renewables consumed. This makes Finland one of the leading EU countries when it comes to utilising wood for energy purposes.

Of single energy sources, the consumption of black liquor and other concentrated liquors diminished the most – by a quarter to 110 petajoules – because of the reduced production by the forest industries. Forest industries are, however, the largest consumer of wood fuels, which in 2009 made up 78% of all mill fuels used by the forest industries and approx. a half of all electricity consumed by manufacturing.

Solid wood fuels were consumed to the total of 152 petajoules or 20.2 million m³, 4% less than in the previous year. The heat and power plants accounted for 94 petajoules or 13.5 million m³, approx. 6% less than in the previous year. This resulted mainly from the decreased consumption of forest industry by-products (industrial chips, sawdust and bark) – 7.5 million m³ – which fell in 2009 to the lowest level in this decade.

Small-sized residential housing annually uses 6.7 million m³ of wood for heating. Together with the wood consumed in various types of commercial and office buildings, the energy content of this small-scale combustion of wood reached 58 PJ.

The consumption of forest chips reached its highest volume ever – 6.1 million m³ – in 2009. Finland aims to increase the annual consumption of forest chips to 12–13 million m³ by the year 2020. This goal is based on the commitments set by the European Union: Finland has to increase the share of renewable energy sources (based on final energy consumption) from the current 28.5% to 38% by the year 2020. Forest chips will cover half of this increase.

In 2008, Finland's greenhouse gas emissions amounted to 70.1 million tonnes of carbon dioxide equivalent (Mt CO_2 eq.), which was 10% less than in the previous year and 1.2% below the Kyoto Protocol target. The annual increase in carbon stocks sequestrated by the forest biomass amounted to 38.3 Mt CO_2 eq., which was 19 per cent more than in the year before. This means that Finnish forests act as carbon sinks.

10 Forest industries

In 2009, as a result of the global economic crisis, Finnish forest industries were forced to adjust their production volumes to correspond to the decreased demand of forest industry products. Consequently, forest industry production was down by one-fifth from the preceding year. In the wood-products industries, production volumes decreased by as much as 21%, while in the pulp and paper industries the decline was less drastic at 18%. The added value generated by the forest industries amounted to EUR 2.9 billion, representing 13% of the total added value in all manufacturing industries. On average, the forest industries worked at only 70% capacity in 2009 (cf. 84% in 2008).

The production of sawn goods amounted to 8.1 mill. m³, a fall of close to one-fifth from 2008 and the lowest level since the early 1990s. The decrease was primarily due to a steep slump in construction activities, both on domestic and export markets. Domestic consumption of sawn goods contracted to less than 0.7 m³ per capita. Plywood production in Finland collapsed drastically to 0.78 mill. m³, indicating a decrease of 38% from the previous year. The fall in production was particularly marked in the case of birch plywood.

Production capacities in the pulp and paper industries have been significantly reduced in Finland in recent years. In 2009, a total of 10.6 million tons of paper and paperboard was manufactured, that is 19% less than the

year before. Of the total production in Finland, magazine paper and newsprint account for approximately 40%. Their production volumes fell by one-third to 4.2 million tons. As far as fine papers are concerned, production decreased only 11% from the level in 2008. With the drop in paper demand, the production of wood pulp also diminished by one-quarter to 8.7 million tons. Domestic investments by the forest industries (EUR 0.28 billion in 2009) plunged to an exceptionally low level, amounting to only 1.7% of the annual turnover. Approximately 70% of the turnover generated by the forest industries is attributable to the pulp and paper industries.

In Finland, recycled paper and paperboard represent 5% of total raw material use in these industries. In 2009, the collection rate amounted to 71% of total domestic consumption of paper and paperboard, or 136 kilograms per capita.

The profitability of the forest industries continued to deteriorate in 2009. Measured as an operating margin, profitability fell to an unprecedentedly low level. In the forest industries as a whole, the operating margin fell to EUR 0.3 billion, corresponding to 2% of domestic turnover in 2009. In the wood-products industries, the operating margin turned negative, while the pulp and paper industries showed positive operating margins (3.3% of domestic turnover).

In 2008, Finland's greenhouse gas emissions amounted to 70.1 million tons of carbon dioxide equivalent, or 10% less than in the previous year. The emissions in 2008 were one per cent below the Kyoto Protocol target level. This was mainly attributable to decreased emissions from the energy sector. In 2008, fuel-based emissions by the forest industries amounted to 5.2 million tons, corresponding to 7% of total greenhouse gas emissions in Finland.

11 Foreign trade by forest industries

In 2009, the total volume of wood imported into Finland decreased drastically to only 9.2 million solid cubic metres (over bark). This volume was the lowest since 1997. The threat of an increase in wood export duties in Russia (albeit discarded) and the economic recession were the main reasons for the decline in the flow of wood. The imported wood volumes corresponded to 22% of domestic commercial roundwood removals. The volume of wood exports amounted to a customary 1.2 million m³.

6.1 million m³ of the wood imports originated from Russia. Until 1997, Russia's share of the wood flow to Finland was about 80%. In 2009, its share ended up as 67% of all imported wood. Latvia and Estonia were the second and third most important suppliers with imported wood volumes of 1.1 million m³ and 0.9 million m³, respectively.

The timber assortment distribution of imported roundwood changed a lot from the previous year. Birch pulpwood had been the most important assortment for years, but in 2009 chips took the number one position. The imports of birch pulpwood fell by 75% compared to the previous year and amounted to 1.9 million m³. The imports of chips fell by only 21% and totalled 3.2 million m³. One-third of the imported wood flow consisted of chips. The considerable increase in the figures for fuelwood bucked the trend of diminishing wood imports. The imports of fuelwood almost quadrupled from the previous year, totalling 1.0 million m³. The reasons behind this were the temporarily diminished supply of fuel peat and by-products from the forest industries.

In 2010, the level of wood imports began to rise. Despite growing volumes, the level of wood imports still remains lower than before the year 2009.

In 2009, the global recession had a serious impact on Finnish exports. The nominal value of the exports of Finnish forest industry products declined by 23% from the previous year. Their value totalled EUR 8.7 billion, accounting for 19% of Finland's total exports of goods (EUR 45.1 billion). Of the value of exports of forest industry products, 81% represented the pulp and paper industries, and the remaining 19% was wood-products industries. The most important export products were magazine paper (EUR 2.3 billion) and fine paper (EUR 1.7 billion). The bulk of Finnish forest industry production is exported. In 2009, exports accounted for 92% of paper production, 90% of paperboard, 63% of sawn goods and 88% of plywood. Pulp is produced mainly for domestic use; only 17% of pulp was exported.

According to the unit value index of the foreign trade of goods, the export prices of all Finnish goods fell by 6.5% between 2008 and 2009. The unit prices of wood and wood products were down by 8.3% from the previous year. With pulp, paper and paper products, the unit prices were reduced only by 2.1%. The effect of diminished export volumes on the value of exports of the forest sector was greater than that of the lower unit prices.

Finnish exports – especially exports of forest industry products – are in the hands of just a few companies. Five companies accounted for 24% of Finland's exports of all goods. With forest industry products the centralization is more intensive, and the share of the five biggest companies made up 60% of exports.

The European Union (EU27) is the main market area for Finnish forest industry products, accounting for 64% of exports in 2009. As the second important market area, Asia's share was 12%. Germany was still the most important customer, receiving EUR 1.6 billion's worth of Finnish forest industry products. Germany's share of the total exports of forest industry products was 19%. As previously, the United Kingdom was Finland's second most important trade partner with a value of EUR 1.0 billion and a share of 11%.

Imports of forest industry products to Finland were minimal, amounting to only EUR 1.2 billion. The most important product group was converted paper and paperboard products (EUR 0.3 billion). 26% of forest industry product imports originated from Sweden and 11% from Germany.

The Finnish foreign trade statistics on forestry products are based on data compiled by the National Board of Customs.

12 Forest sector in Finland's national economy

In the Finnish national economy, the recession deepened in the first half of 2009. Although some signs of recovery could been seen in the second half of the year, the gross national product (GDP) at market prices fell to EUR 171 billion and by volume 8% from the preceding year. The value added in real value of the forest sector contracted by 21% to EUR 6 billion, and its share of GDP sank to 4%. In forestry, the value added was EUR 2.5 billion (–21%), where as much as EUR 0.7 billion was generated in stock net increment value. The value added in the wood-products industries was 1.0 (-22%) and in the pulp and paper industries 2.5 (-19%).

In non-industrial, private forestry, gross stumpage earnings in 2009 sank to EUR 1.0 billion. This was the lowest income in real value since the depression in the early 1990s and 40% less than the five-year average. For all ownership categories, stumpage earnings totalled EUR 1.2 billion (-36%). A total of EUR 305 million was invested in silvicultural and forest improvement works, of which EUR 224 million was spent on private forests. The operating profit for non-industrial, private forests fell to EUR 53 per hectare, which is EUR 54 less than the average for the preceding five-year period. The decrease in stumpage prices diminished the real return on timber production to minus 18%.

13 International forest statistics

Almost one-third – 31% – of the global total land area is covered by forests. This amounts to slightly over 4 billion hectares of forest land. The countries with the largest forest cover are Russia, Brazil and Canada, which together make up 40% of the total forest area. The global growing stock volume (over bark) is estimated to be 527 billion m³. One-third of the growing stock is in South America, where Brazil has the world's largest volume of 126 billion m³. The growing stock volume in Europe is 112 billion m³, of which Russia accounts for 82 billion m³. The forest land area of the European Union is 157 million hectares and the growing stock amounts to 24 billion m³.

Approximately 5% or 47 million ha of Europe's forests are currently protected. Protected forests are categorised according to the MCPFE (*Ministerial Conference on the Protection of Forests in Europe*) classification into four classes. About 27 million ha of the protected forests lie in the area of the European Union. This represents 18% of the Union's forest land area. In the EU, Germany has the largest area of protected forests: almost 8 million ha, or 70% of its forest land area. Europe's largest areas of protected forests are in Russia – 16 million ha in total.

Due to the global recession, production of the forest sector remained at a low level in 2009. Total roundwood production (removals) amounted to 3.3 billion m³ (without bark) and the production of sawnwood to 369 million m³. Compared to the previous year, the production of roundwood decreased by 4%, and for sawnwood the drop was 8%. The production of wood-based panels decreased by 5% to 255 million m³ in 2009. Paper and paperboard production, 373 million tons, was 4% less than the year before.

The EU has an important role as a producer of forest products. In 2009, the production of roundwood amounted to 401 million m³, which was 5% less than the production of the previous year. About a quarter of the world's sawnwood, 94 million m³ in 2009, is produced in the EU. The EU also maintains the leading position as a producer of paper and paperboard and is the second largest producer of wood-based panels. In 2009, the EU's production of wood-based panels amounted to 59 million m³ and the production of paper and paperboard to 97 million tons.

In global terms, the forest sector employed 13.8 million persons in 2006. This represents a 0.4% share of the total labour force. The forest sector's contribution to the world's GDP total was only one per cent.

Summary