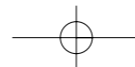
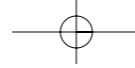


THE ROLE OF THE SWEDISH FOREST INDUSTRY IN SUSTAINABLE DEVELOPMENT



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»The forest industry is one of the most important sectors of industry in Sweden. It does, after all, accounts for such a high proportion of our export income.«

King Carl XVI Gustaf

»Forestry is an almost spiritual mission. It uses a time horizon of generations, since it involves accepting responsibility for something that is growing and developing, something that we ourselves may never harvest. It is part of our environment and our cultural heritage, yet also production, naturally. The forest genuinely is Sweden's major export resource, whose exports are Swedish through and through. And that says something about how important forest industry is. And of course it is only by taking joint action across national borders that we can successfully create a sustainable society.«

Göran Persson, Prime Minister of Sweden

FOREWORD The Swedish forest industry is the world's second largest exporter of sawn timber, and the fourth largest exporter of pulp and paper. The companies in the industry, not only the global enterprises, but also small and medium-sized firms, also supply the local market with forest products. • www.forestindustries.se

Measures to ensure sustainable development are high on corporate agendas in the industry, and in this publication we hope to give politicians, and other decision makers and stakeholders, a picture of what has been done and is still being done all the time in the sector. We also refer the reader to the annual reports and the environmental/social responsibility reports of each individual company, as well as to material published by our organisations in Europe, such as CEPI's *The European Paper Industry on the Road to Sustainable Development* and CEI-Bois' *European wood fact sheets*. • www.cepi.org • www.cei-bois.org

How is the Swedish forest industry promoting sustainable development?

“Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.”

That is the definition of sustainable development used in the Brundtland Commission's report. Sustainable development is based on long-term thinking in which economic, environmental and social aspects are balanced.

In the Swedish forest industry this long-term approach is natural. The trees we plant today will benefit our children and grandchildren in the future.

The forest industry's products satisfy important needs, and they are produced from renewable raw materials using environmentally sound processes. This makes it natural for the Swedish forest industry also to see sustainable development as part of the mission for the industry as a whole.

THE ECONOMY Economic growth is a fundamental precondition for achieving tomorrow's economic and social goals. If we are to achieve our national growth targets, the forest industry must also expand. The goal of the Swedish forest industry is to strengthen its competitive position on international markets and to develop its business in Sweden. Profitable companies are best placed to invest in new technology that will help to improve the environment, and in new lines of business that will provide jobs.

THE ENVIRONMENT The Swedish forest industry has stated categorically, in a declaration of intent, that its environmental programmes shall be characterised by a holistic approach in which forests, processes and products are all part of a sustainable eco-cycle. The industry is to process wood from sustainably managed forests in which biodiversity is maintained. Environmental measures are to be focused on continuous improvements. It has also been established that the forest industry is to make lean use of resources and energy, and encourage the public to see the use of recovered paper as an environmentally sound aspect of the eco-society.

SOCIAL RESPONSIBILITY The forest industry in Sweden, together with its trade union counterparts, has set itself

the target of overcoming problems associated with ill health, reducing levels of sick leave and preventing industrial accidents. The social partners are also taking joint action to promote competence development and equality of opportunity.

As you can appreciate, the Swedish forest industry has already made good progress along the road to sustainability – but nonetheless much remains to be done.

However, what is important is that the process of change is already in motion. Sustainable development has top priority in the Swedish forest industry. Consequently the industry is very well placed to meet the challenges of the future.

Stockholm, June 2005

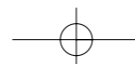


Marie S. Arwidson

Marie S. Arwidson
Managing Director
Swedish Forest Industries
Federation

Kenneth Eriksson

Kenneth Eriksson
Chairman
Swedish Forest Industries
Federation



The economy

Economic growth is essential for sustainable development. Profitable enterprises generate resources for improving living standards and effective environmental measures. The forest industry is a cornerstone of the Swedish economy. The industry's goal is to strengthen the competitive position of the companies and to develop their activities in Sweden.

Sweden's forests and the country's forest industry represent a unique opportunity, as Sweden is the world's second largest exporter of sawn timber and the fourth largest exporter of pulp and paper.

Cluster of world class

The term cluster is one that economists readily use – as a complement to the traditional concept of industry or sector. The very heart of the forest industry cluster consists of forestry and forest products industry, around which are numerous suppliers in industries such as engineering, IT, chemicals, logistics and a wide range of service enterprises. Printers, packaging companies and other converting and processing industries are also key components of the cluster. Universities, institutes of technology and research institutes acting in close association with industry are essential for a successful cluster.

Sweden's forest industry cluster is one of the most advanced in the world and accounts for one-fifth of the country's exports and one-third of its industrial investments.

High export revenues

In 2004, the forest industry exported pulp, paper and sawn timber for a value of SEK 110 billion (Swedish kronor), which was just over twelve per cent of the country's total exports. The wood and other input materials used in the industry are largely of domestic origin. The Swedish forest industry thus accounts for:

- 12 per cent of the country's exports
- 20–25 per cent of its industrial investments
- around 12 per cent of the sales, added value and employment in industry
- three per cent of GDP. If we include forestry, the share is four per cent.

Employment at several stages

As with the manufacturing sector in general, direct

employment in the forest industry has been declining, and the number employed now amounts to 76,000. However, the industry's importance is far greater than these figures would imply, since each job in the sawmilling and pulp and paper industries generates almost two jobs at their suppliers.

The forest industry is capital intensive, and when major investment projects are carried out in many cases they represent a process of revitalisation among small and medium-sized firms in the region. In 2004, the industry's investments amounted to almost SEK 10 billion. This generated jobs for around 8,000 people on an annual basis in the engineering and building industries, and at consultants and other suppliers.

Importance at regional level

As the forestry and forest products industries are dispersed throughout the country, the forest industry is of importance to the regional economy. There are sawmills, and/or pulp and paper mills at 250 towns or villages in Sweden, often in areas where employment is weak. In many cases, these mills are essential for the maintenance of a variety of service functions in these sparsely populated rural areas. Tax revenues are important and the mill's activities also create the population base needed for schools, medical centres, banks and shops to survive.

World-class research

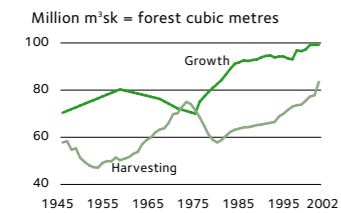
Over the years, the industry, in partnership with the government, has built a forest industry research network of highest world class. In many research areas – especially in the case of research that is related to the environment – Sweden is a world leader. For example, STFI-Packforsk, the industry's research institute, has been engaged to co-ordinate three large integrated research programmes in the EU. The forest industry invests around 25 per cent of its research budget in collective, industry-wide research, a far higher proportion than in any other industry. The distribution of the industry research expenditure is as follows:

- Company: SEK 1,300 million.
- At industrial research institutes: SEK 260 million.
- At universities and institutes of technology: SEK 140 million.
- Total: SEK 1,700 million annually.

Forest assets still growing strong

The volume of wood in Sweden's forests has been increasing steadily over the past century, and now amounts to 3,000 million forest cubic metres (m³sk), which is more than ever before. Each year, the forests grow by more than 100 million m³sk, of which around 85 million m³sk are harvested. This means that the stock of wood, as well as the potential for harvesting in the future, is still growing strong.

Growth and harvesting



Harvesting volumes in Sweden are lower than the annual growth.

The question of whether Sweden's forest assets will be adequate to meet the needs of the forest industry, the energy sector, and of the nature conservation interest, was a topic of lively discussion in 2004. The outcome was that the Swedish Board of Forestry issued a warning that harvesting levels were beginning to reach the limit of what was sustainable. However, there was never any risk that the country's forests were running out of wood. The point made by the Board was that the gap between existing and potential harvesting levels had narrowed, and that we needed a serious discussion about the purposes to which Sweden's forests should be put. Forests are available for many interests, but they are not adequate to satisfy all demands made on them. Sooner or later, we will have to decide on our priorities.

The Swedish Forest Industries Federation's assessment of future growth and harvesting potential is positive. In a report it demonstrated that harvesting levels over the coming years can be raised to just over 90 million m³sk without regrowth or environment being compromised. In the long term, the volume harvested each year can be increased even further, to just over 110 million m³sk.

The Skogforsk research institute has also commented that considerable growth and harvesting potential exists using currently known and tried silvicultural methods, and that with more intensive forestry, it would be possible in the longer run to raise annual harvesting volumes by almost 15 per cent.

Storm felled 70 million m³sk

The storm on 8-9 January 2005 was the worst catastrophe to have hit Sweden's forests in modern times. In the south of the country around 70 million m³sk of wood were felled by the storm, which corresponds to almost an entire year's harvesting for the country as a whole.

At a regional level, the storm will affect the supply of

wood and harvesting potential for many years to come. During the coming two years, the volume available will exceed demand. As a result of transfers of transportation and harvesting resources, mills elsewhere in the country will experience disturbances to their wood supplies. Once the storm-felled wood has been used, there is a risk that the forest industry in southern Sweden will instead suffer from shortages of wood.

In a longer and more national perspective, the consequences will be relatively marginal. Only two per cent of the total stock of wood in Sweden was felled by the storm.

Social responsibility

Increasingly the focus of sustainable development is on social aspects. With questions relating to ethics and the wish to be regarded as a good citizen the companies now have the spotlight thrown upon them.

For a company that aims to be a good citizen it is not enough merely to try to earn a profit and increases in value for its owners. Do this in a way that is compatible with sustainable development is now just as important. As an employer the Swedish forest industry is in a good position to respond to these challenges.

Working hours and work organisation

The activities of the forest industry have to be largely based on shift work. If this is to be combined with sustainable development it needs to be adapted to the varying needs of different people. In Sweden the industry co-operates with the trade union organisations and social scientists in identifying working practices for shift-work that are as employee-friendly as possible.

Measures to promote good health

The Swedish forest industry has also been engaged for many years in extensive measures to highlight those aspects of management and the work organisation that foster good health. For example, there has been a substantial re-working of the Cooperation Agreement* that regulates the work environment, work organisation and health-promoting management, company health services, equality of opportunity and discrimination, competence development and cooperation at local level.

The forest industry has also been engaged for some time in systematic measures to prevent accidents at work.

Equality of opportunity

A central section of the Cooperation Agreement deals with the common goal of the two sides – that everyone should enjoy equality of opportunity, based on aptitude and ability for employment, training, promotion and development at work. Men and women should receive equal pay for work of equal value and also enjoy conditions of employment that are equal in other respects. The achievement of these goals requires continuous

and planned measures in the areas of equality and diversity.

Competence development and recruitment

A crucial area for sustainable development involves creating conditions that will attract more capable people into the industry and then giving them opportunities to develop and do a good job.

The whole question of competence supply, together with related management issues, is becoming increasingly important for the competitiveness of the industry. In order to improve knowledge about the forest industry systematic activities are being arranged at both company and industry level. Over the past six years more than 50,000 upper secondary school pupils have been involved in the "Journey into the Future" project. Systematic contact activities are also arranged for selected faculties at universities and institutes of technology.

A long-term and sustainable approach

The structure of the forest industry – a highly capital-intensive industry with long lead times between when the trees are planted and the wood is harvested – is itself a reflection of long-term measures and sustainability through economic cycles.

The industry is characterised by a deep awareness of not only the opportunities but also the responsibilities involved in being a good and sustainable citizen at local, national and global level.

* The Cooperation Agreement between the Swedish Forest Industries Federation and the trade union organisations in the forest industry is a central feature of their measures relating to the social dimension of sustainable development.

»Development that is sustainable is not only a necessary but also a challenging target. Cooperation at all levels will improve our chances of reaching this target and make our intention of doing so genuinely credible.«

Sune Ekbåge
Chairman of the Swedish Paper Workers' Union
Kjell Dahlström
Chairman of the Swedish Forest
and Wood Trade Union

»Health, efficiency and profitability all depend on each other.«

From the Cooperation Agreement

Half as many accidents and cases of sick leave

The motto for the programmes to promote good health in the Swedish forest industry is "health, efficiency and profitability all depend on each other".

In Sweden, the employers and the union organisations have set themselves the joint target of achieving the following key performance figures within three years:

- **HEALTHY LABOUR FORCE** More than 40 per cent of the employees should be healthy*.
- **SAFE WORKPLACE** No more than 1.5 accidents per 100 employees – half of the present level.
- **LOW SICK LEAVE RATE** An average of 3.3 per cent for the industry – half of the present level.

* By "healthy employees" means people who have been employed for at least three years and who during the previous two years have not been absent on account of sickness.

The environment

With its renewable raw materials, environmentally adapted processes and recoverable products the forest industry is well placed to contribute to sustainable development.

When forests are properly managed they are a renewable resource that we can consume and yet still have. The stock of wood will remain at a high level when harvesting is in balance with long-term growth. It is just as important to preserve biological diversity and protect or re-create high natural values.

Swedish forestry is based on the principle that care of the environment and production of wood are equally important. This is reflected in the Forestry Act of 1994, which has two goals of equal importance: one environmental and the other expressed in terms of production.

From words to action

In 2001 the Swedish Board of Forestry published an evaluation of Swedish forestry and the country's forestry policy. In a report it was observed that as far as environmental activities are concerned, the forest industry has moved from words to action. The voluntary reservation of forest land on the grounds of nature conservation has increased and there has been a considerable improvement in environmental consideration. More trees and more dead wood have been left in the harvested areas. Areas with threatened species are being protected.

To sum up, Swedish forestry is well to the fore when it comes to environmental consideration:

- Attention is paid to nature conservation on all forest land, not only in nature reserves and similar areas.
- Of the total Swedish forest area of some 27.5 million hectares, 6 million hectares (22 per cent) are excluded from forestry on account of nature reserves, protection of habitat, nature conservation agreements or because the land is classified as unproductive forest land.
- Around 60 per cent of the forests are certified in accordance with the FSC® and/or PEFC® forestry certification systems. The average in Europe is just under 50 per cent.
- Considerable resources have been and are being devoted to education and training in nature conservation for those who work in the forests.

Lean use of resources

When it comes to the production of wood and the use of

forest resources, forestry in Sweden has long been carried on in a sustainable way:

- The volume of growth is higher than that harvested and more new trees are planted than are felled.
- The stock of wood has almost doubled since the 1920s. At the same time the commission that wrote the report noted certain shortcomings in the way forestry was carried on during the period investigated (1993–1998).
- The proportion of approved regeneration had fallen from 83 per cent to 74 per cent.
- Precommercial thinning of forests had been neglected and there is now a need to do more.

The Swedish forest industry's goal is to deal with these shortcomings by focusing on the quality of its forest management. Forest companies are investing substantial resources in improved seedling systems, which means improved regeneration. The companies have also launched programmes for more intensive precommercial thinning.

Recovery – important aspect of the eco-cycle

The use of recovered paper means that the wood raw material is used in a more effective way and the volume of waste is limited. Often the use of recovered paper also brings benefits in terms of production economy and marketing.

Sweden has had a system of statutory producer liability since 1994; this means that the industry has responsibility for collecting newspapers, magazines and paper packaging. There is a voluntary agreement for stationery and office paper.

In 2004 no less than 75 per cent of used paper were collected and used to produce new paper. If energy recovery from the used paper products is also included, around 90 per cent of used paper products are recovered. Wood is also recovered to a considerable extent either as a raw material for new wooden products or as energy.

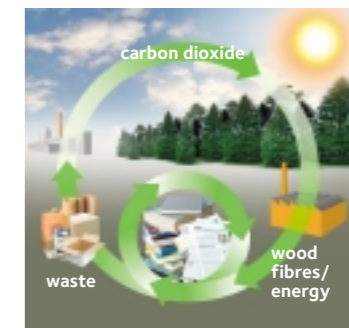
Environmentally adapted lean processes

The effective use of resources is one of the basic pre-conditions for sustainable industrial production. In the



»Sweden has perhaps the most environmentally aware forestry in the world.«

Sweden's Minister of Forestry Ulrica Messing



The sun is the source of power in the eco-cycle

Forests and forest products form part of an ecological cycle. In a process known as photosynthesis, solar energy, together with carbon dioxide and water, is converted into the building blocks for growing trees. This process makes the forest a renewable source of raw materials, whose main products are wood fibres and energy. The wood is used to make paper, sawn timber and bio-energy. As the products can be recovered the fibres can be used many times over. If the waste is incinerated the energy can also be used. When either paper or timber waste are incinerated or allowed to decay carbon dioxide is released into the atmosphere. The forests absorb the carbon dioxide and use it again in the photosynthesis process. This completes the circle.

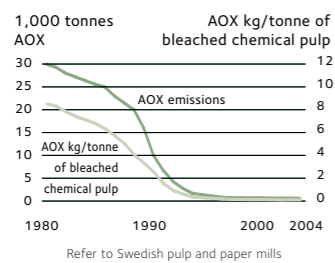
European declaration on paper recovery

CEPI, the European trade organisation for the pulp and paper industry, has launched a declaration that by 2005 the industry will have increased its recycling rate for paper to 56 per cent at European level. Sweden is making a valuable contribution to ensuring that this target is achieved. In Sweden more than eight out of ten newspapers are recycled and seven out of ten items of paper packaging. (www.cepi.org)

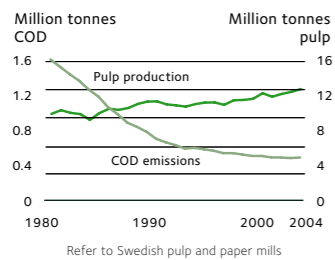
Sharp reduction in emissions

- For the past ten years or more no chlorine gas has been used by Swedish pulp mills. Emissions of chlorinated compounds (AOX) have declined by more than 95 per cent since the beginning of the 1980s.
- Emissions of organic substances (COD) that could cause oxygen deficiency in water courses have been reduced by more than 85 per cent since the beginning of the 1980s.
- Emissions of sulphur dioxide have been reduced by more than 95 per cent since the beginning of the 1980s.

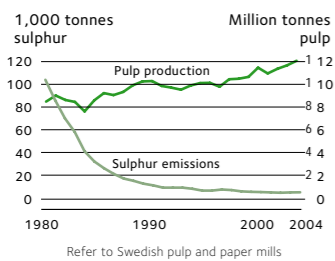
Emissions of chlorinated organic substances (AOX)



Emissions of dissolved organic substances (COD)



Emissions of sulphur



► forest industry system, which includes forestry, pulp and paper mills, sawmills and biofuel production, the yield from the utilisation of resources is high. Different parts of the tree are used in different industrial sectors, which exchange by-products amongst themselves. Production systems in the pulp and paper industry are based on an internal eco-cycle that involves the re-use of process chemicals, wood residues and energy. It is inevitable that industrial facilities as large as pulp and paper mills have an impact on the environment. However, all Swedish mills have taken far-reaching measures to close their processes, clean their emissions and thus minimise their impact on the environment. From being one of the main polluters, the Swedish forest industry is now regarded as a model in the environmental field.

The sawmilling industry has been engaged in continuous environmental activities, which have focussed primarily on reducing noise, emissions into air and waste management.

Energy-efficient production

The forest industry has made great efforts to reduce its energy consumption and Swedish mills are among the most energy-efficient in the world.

- Total fuel consumption in the pulp and paper industry has remained broadly unchanged since the beginning of the 1970s, even though production of pulp and paper has doubled. In other words, its specific fuel consumption has substantially been reduced.
- Oil consumption has been lowered by 65 per cent since 1980. The oil has mainly been replaced by internally produced bio-fuels, such as bark and recovered spent liquor. Emissions of fossil carbon dioxide per tonne of pulp and paper have consequently been reduced.
- Internal biofuel-based production of electricity at the mills has increased. A further increase in output from 5 TWh to 6.5 TWh per year can be expected.

Parallel to this, electricity requirements have risen, mainly as a consequence of the increase in the production of thermo-mechanical pulp (TMP***), a higher degree of processing and higher quality demands. The TMP process has helped to reduce oil consumption as a large proportion of the heat generated by the TMP process is recovered and used to dry the paper in the machines. The production of TMP is also a resource-lean process since almost one hundred per cent of the wood is used.

Cleaner transportation

The Swedish forest industry adopted an industry-wide environmental policy for transportation in 1998. This stipulates that the forest industry shall promote the far-

reaching environmental adaptation of its transportation. One of the concrete aims decided on was that vessels chartered by the industry that operate in its traffic system are to run on low sulphur (maximum of one per cent) fuels. The ships shall also be equipped with catalytic cleaning of emissions or equally effective systems to reduce air pollution.

The target for sulphur content has been achieved, which has reduced sulphur emissions by 70 per cent. It has also been possible to radically reduce emissions of nitrogen oxides, with several ships achieving reductions of 95 per cent. Around two thirds of the forest products exported are transported by ship, mainly using specially designed vessels.

The pioneering work of the industry in the environmental field has gained international recognition. In June 2004 three Swedish forest companies – SCA, Södra and Stora Enso – received the “EU’s Clean Marine Award” for their successful development of eco-friendly marine transportation systems.

The forest and its products benefit the climate

The fact that forests absorb carbon dioxide from the air is of great importance for the Earth’s climate. Carbon is stored in trees and in forest land. This moderates the greenhouse effect and helps to prevent climate change. However, the forests must be managed in such a way that the production capacity of the ground is optimised.

Large quantities of carbon are also stored in forest products, mainly wooden houses and other wood products with a long life span, but also in the paper and packaging products that are part of the eco-cycle. The more growth there is in the forests and the more we use forest products, the better it is for the climate.

The forest industry’s view is that raw materials from our forests should in the first instance be used for further processing within the industry. However, bio-fuels from the forest and by-products from the forest industry’s processes can to some extent be used to replace fossil fuels. CEPI, the European trade organisation for the pulp and paper industry, has set a target that the European industry shall increase the proportion of bio-energy used in its mills from 49 to 56 per cent by 2010. The Swedish share is already 80 per cent. Moreover, forest industry products that cannot be recycled as recovered paper, for example by-products from certain packaging and printed matter, as well as certain hygiene products, can be recovered for use as biofuel.

* Forest Stewardship Council.

** Programme for the Endorsement of Forest Certification Schemes.

*** Thermomechanical pulp (TMP) is a high-yield pulp for papermaking that is produced by heating woodchips and then grinding them in refiners.

VISIONS

More ecologically balanced mills

For the past decade or more, “ecological balance” has been a theme in companies’ work to base their activities more and more on the eco-cycle and a holistic approach. In the collective industry-wide research carried on at STFI-Packforsk this theme has also served as a basis for major projects focusing on pulp mills.

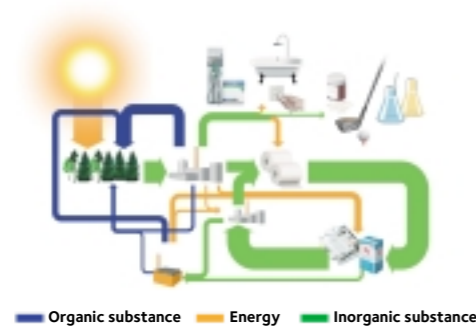
In various research programmes scientists have demonstrated that potential still exists to further close pulp processes, take advantage of opportunities to improve energy efficiency, and to minimise the use of non-renewable resources. New technology and new types of process are regularly being introduced at the mills.

Efficient use of energy and the possibility of replacing fossil fuels with bio-energy are being given even higher priority, and when it comes to large-scale recovery of bio-fuel from pulp mills the STFI’s scientists consider that significant technical advances are to be expected. The extraction of lignin from the process for use as a biofuel is a technique that in some cases is believed to have considerable potential. Gasification of spent liquor to produce “green electricity” and “green” motor fuel is another method that is being developed that could be of interest in specific applications. Woodchip leaching has turned out in mill trials to have interesting potential and can lead to significantly improved use of resources at certain pulp

mills. At chemical pulp mills there are large volumes of biomass that can be used in different ways. Considerable quantities of bio-based electricity are already being supplied, but an increase is conceivable.

One interesting possibility that is also being studied by scientists, is the extraction of chemicals – “green polymers” and other products – from the organic residues at pulp mills. The idea is to develop a sort of bio-refinery. Investigations are being made, for example of the possibility of extracting valuable bio-phenols from the pulp mill’s lignin. If this turns out to be a competitive alternative, these could be processed into various types of binding agents, plastics, carbon fibres, composites and so on.

Scientists are also exploring the possibility of extracting from hemicellulose, which occurs in black liquor for example, chemical additives for the paper industry, emulsifying agents, film, hydrogels and other products for the food, packaging and pharmaceutical industries as a complement to traditional fibre-based products.



Pulp and paper production form part of a natural eco-cycle that is driven by the energy provided by the sun. Wood and water are fed into mills whose production processes are closed for the most part and produce minimal emissions into the environment. The main products coming out of the system are pulp, paper and energy that can be used in other sectors of the economy. Everything else is part of the system’s eco-cycle.

Vision 2030 – a technological platform

Together with research institutes, companies and government bodies, the Swedish Forest Industries Federation, in cooperation with CEPI, CEI-Bois and CEPF, has been taking steps to ensure that research into forestry and forest products is given a prominent position in the EU’s seventh framework programme.

As one aspect of this a European technological platform known as “Innovative and sustainable use of forest resources” has been worked out jointly with the EU Commission. In the platform it is noted that the forest-based sector can help to create a sustainable European economy. New products, new markets and new, smart applications based on the needs of society and consumers will be cornerstones in this process. Innovations, research and knowledge are prerequisites for this development and progress. The platform presents a vision for 2030: *“The European forest-based sector plays a key role in a sustainable society. It comprises a competitive, knowledge-based industry that fosters the extended use of renewable forest resources. It strives to ensure its societal contribution in the context of a bio-based, customer-driven and globally competitive European economy.”*

The Swedish forest industry’s declarations of intent for its environmental activities and for transports and the environment are available on www.forestindustries.se

More information about “Innovative and sustainable use of forest resources” and “Vision 2030” is available on www.forestplatform.org