Products from the forest – a natural choice

The Swedish Forest Industry’s sustainability publication 2008–2009
The Swedish Forest Industries Federation is the trade and employers’ organisation for the Swedish pulp, paper and sawmill industries. The Federation is involved, in association with its member companies, in Swedish and European industrial policy, employer issues and in market issues on wood engineering products.

The Federation represents around 50 pulp and paper mills owned by 25 groups/companies and around 140 sawmills owned by some 70 groups/companies, as well as some companies that have close ties to the production of pulp, paper and sawn timber.

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ABOUT THIS SUSTAINABILITY PUBLICATION

The Swedish Forest Industries Federation’s sustainability publication describes the industry’s work for responsible and sustainable business.

This is the Swedish Forest Industries Federation’s third sustainability publication, which describes the work of the industry from an environmental, social and economic perspective. Swedish Forest Industries Federation intends to issue a sustainability publication every second year. The last was published in spring 2008.

A working group of representatives from member companies and the Swedish Forest Industries Federation has been central to the process of producing the publication.

STAKEHOLDERS AND TARGET GROUPS

The publication is primarily aimed at politicians, authorities, non governmental organisations and union organisations and seeks to paint a comprehensive and fair picture of the sustainability work in the industry.

In defining the focus areas and content for this publication, representatives from different stakeholder groups were contacted. Around 15–20 separate meetings were held with representatives from authorities, unions, non governmental organisations, political parties and research institutes. In addition, some 30 people from member companies and stakeholder groups were asked to give their views on the previous publication by completing a questionnaire. The Swedish Forest Industries Federation has taken those views on board and is constantly working to improve its sustainability efforts.

DATA AND INFORMATION DOCUMENTATION

The facts and figures quoted in the publication refers to company operations in Sweden and is comprised of information reported to authorities for 2008, along with material produced specifically for this publication (for 2008 or 2009). Unless otherwise stated, environmental data refers to companies that are subject to reporting requirements. In principle, this includes all pulp and paper mills, but only the larger sawmills. During 2010, the industry aims to also collect environmental data for at least 60 percent of sawmill annual production. Unless otherwise stated, social and economic indicators relate to all member companies.

The economic recession has resulted in cutbacks being made in the industry, which has had a certain effect on raw materials consumption and emissions. Otherwise, no significant changes have occurred compared to the period covered by the previous sustainability publication.

In the report, Global Reporting Initiative’s (GRI) C level guidelines have been applied.

FURTHER INFORMATION

Our website (www.forestindustries.se) contains additional information about the sustainability work in the industry. The site also hosts the pulp and paper mill environmental database. For more information about an individual company’s operations, please refer to the company’s website.

THIS IS THE SWEDISH FOREST INDUSTRY

The forest industry is a cornerstone of the Swedish economy. It is a technologically advanced business that is based on the natural and renewable raw materials of the forest. The industry provides employment throughout Sweden, not least in regions where the labour market is weak.

The forest industry is one of the oldest in Sweden and, together with the iron and ore industries, turned Sweden into an industrial nation in the 19th century. The forest industry continues to be one of Sweden’s most important business sectors, and has a true desire to contribute towards sustainable development – economic, environmental and social – now and in the future.

The forest resource lies at the heart of the business, and the industry assumes significant responsibility for creating conditions for allowing the forest to continue to grow and produce raw materials of the highest quality in balance with the environment.

The forest industry produces newsprint, packaging, cardboard, hygiene products, sawn products, energy, bio-energy products and manages forests. It also conducts research in a variety of different areas, including biofuels, new chemicals and cellulose-based plastics.
The Swedish forest industry is therefore set to continue
to play an important role. We are in a leading position
in the European forest research collaboration. We are
the second biggest exporter of pulp, paper and timber
products taken together. We can, through high forest
growth with consideration to biodiversity, provide
many countries with climate adapted forest products – and at the same time allow the forest to grow.
And, last but not least, the far-reaching objectives set
out in this publication enable us to continue to chal-
lenge both ourselves and others.

Leif Brodén Marie S Arwidson
Chairman of the Board  CEO

THE FOREST INDUSTRY AND CLIMATE CHANGE
Following the Copenhagen Summit held in December
2009, climate change has never been discussed as much
as it is at the moment. The forest industry, which uses
renewable raw materials and manufactures recyclable
products, plays a key role for the climate. In addition,
we are also one of the few industries that has its own
ambitious targets to reduce environmental impact.
Trends also show that we can. The industry has signifi-
cantly reduced its impact on the climate and the environ-
ment by making major energy savings, reducing fossil
fuels in favour of bioenergy and increasing the pro-
portion of railway freight.

The forest industry has, in a number of different con-
texts, been held up as a sustainability role model. For
eexample, in their annual inspection, auditing firm
Deloitte highlighted the pulp and paper industry as
having good and comprehensive sustainability reporting.
In addition, many companies are listed on international
indices that facilitate for investors to identify compa-
nies that work with sustainability in a good way.

EMERGING STRONGLY FROM THE DOWNTURN
The economic downturn has forced many of our member
companies into making difficult decisions, including
making employees redundant and closing parts of their
operations. They have done this in order to remain
competitive in spite of the adverse conditions.

Nevertheless, the forest industry continues to be very
important to the Swedish economy. In order to main-
tain this position, the industry must continue to focus
on attracting young, well-educated people, bringing
gender balance to the workplace and working more on
health and safety issues. In addition, we also need to
conduct research on new materials, biofuels and chemicals
in order to identify new business opportunities. If we
become better in these areas, we will have even more
attractive, dynamic and secure companies and be better
equipped to meet the outside world’s demands for
competitiveness.

THE FUTURE FOREST INDUSTRY
The forest industry can look to the future with confidence.
We are one of the few industries that are based on a
renewable raw material. Our products are an important
part of people’s day to day lives, and demand in the
majority of areas will increase in the long term. The
UN’s Intergovernmental Panel on Climate Change (IPCC) has stated that active forestry and use of wood
and timber products constitute important measures
for counteracting the effects of global warming. Reports
and bills put forward by the Swedish government also
state that forestry plays a decisive role in reducing the
effects of greenhouse gas emissions. Wood-based products
can replace energy intensive and climate affecting ma-
terials, whilst bio-energy from the forest can replace
fossil fuels. In other words, the forest industry can be seen
as a future industry that is needed more than ever.

The Swedish forest industry is therefore set to continue
to play an important role. We are in a leading position
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VISION 2030
The European forest industry:
- Plays a key role in a sustainable society.
- Comprises a competitive, knowledge-
based industry that fosters the extended
use of renewable forest resources.
- Strives to ensure its societal contribution in
the context of a bio-based, customer driven
and globally competitive European economy.

The Swedish forest industries has leading role to
play in realising this vision.

SOURCE: THE EUROPEAN FOREST BASED SECTOR TECHNOLOGY PLATFORM, FTP
THE FOREST INDUSTRY’S TARGETS FOR SUSTAINABLE DEVELOPMENT

The forest industry has agreed on measurable, industry-wide targets in order to move the business in a sustainable direction and to progress forward.

The forest industry has adopted 14 objectives and two visions in order to become even stronger in respect of sustainability. Establishing industry-wide objectives ensures that all companies in the industry work in the same sustainable direction. Many member companies also have their own sustainability objectives that complement those of the industry.

ELABORATED BY MEMBER COMPANIES

The objectives and visions have been elaborated by Swedish Forest Industries Federation’s various committees, which consist of representatives from member companies. They have since been adopted by the Board of the Swedish Forest Industries Federation. Expectations from the industry’s stakeholders, coupled with an assessment of which issues are important for the long-term competitiveness of the industry, have played a decisive role in formulating these objectives.

Most objectives were adopted during autumn 2007, but discussions continued in the committees and a further two objectives were adopted and two revised during autumn 2009. For the financial area, a vision has been formulated.

The base year for the objectives is 2007. Progress will be followed up annually on the Federation’s website, where more information about the objectives is available.

POSITIVE SIDE EFFECTS

The objectives apply to the operations of the Federation’s member companies in Sweden. In many instances, the objectives have effects outside Sweden as they can affect companies’ overall sustainability strategies for their entire business – including those parts located in other countries.

The industry’s efforts to meet the objectives have led to the development of various tools, including a guide for calculating the emissions from transports. This type of tools facilitates for companies to map their sustainability impact and increase their responsibility.

OUR SUSTAINABLE PRODUCTS

- Sawmills shall produce Carbon Footprints for at least 80 percent of their products by year 2010.
- The Swedish paper industry will contribute to the European industry achieving its target for paper recycling (66 percent by year 2010).
- The industry’s R&D investments at universities, technical colleges and research institutes shall increase by 50 percent by year 2012.*
- R&D investments shall double in the long run (year 2030).*
*PRE-REQUISITES FOR TARGETS:
- Public funding should match, or exceed, industry funding.
- In addition, public funding should be made available for risky and demanding demonstration projects on a larger scale than today.

OUR CONCERN FOR THE ENVIRONMENT

- Energy efficiency in the forest industry shall be improved by at least 15 percent by year 2020.
- The forest industry’s own electricity production shall increase by 2 TWh by year 2020.
- By 2020 the forest industry shall have reduced its emissions of fossil carbon dioxide from transports by 20 percent.
- The forest industry shall develop common sustainability criteria for the procurement transportation services by year 2010.

OUR AGENDA FOR FOREST MANAGEMENT

- The annual growth in Swedish forests shall increase by 20 million cubic metres by year 2020.
- The extraction of bio-energy from the forest shall increase by 20 TWh by year 2020.

OUR WORK WITH SOCIAL ISSUES

- A maximum of 1.0 work-related accident with absence per 100 employees by year 2015.
- Health-related absenteeism below 3.5 percent by year 2015. Particular attention on measures to reduce absence among women. (Applies to the pulp and paper industry.)
- At least 30 percent of managers appointed during year 2012 shall be women. In this context, “managers” refers to everyone with staff management responsibilities.
- At least 60 percent of employees recruited during year 2012 shall have a higher education qualification.
The recession affected almost all industries in Sweden during 2008 and 2009, and the forest industry was no exception. The industry was hit by the failing world economy and a downturn in demand. The forest industry is one of the industry sectors that has the greatest significance for the Swedish economy and welfare.

As early as autumn 2007, it was noticed that parts of the forest industry were suffering an economic downturn. By the second half of 2008, this downturn had become severe. This, coupled with overcapacity in certain product areas, resulted in a number of entities in the pulp, paper and sawmill industries being forced to close. The overcapacity is also a result of increased competition from electronic media. However, there are still significant opportunities for the industry.

To this end, the forest industry has formulated a vision stating that production (measured as added value) in the Swedish forest industry cluster shall double by 2035. Half of that growth shall come from new products.

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RETURNs must be secured
Due to the proximity to raw materials, the capital intensity and a long historical tradition, the industry is strongly bound to Sweden. Many Swedish plants are part of international corporations. The competition between investments in different countries is large and investments are made where companies consider the conditions for a high return are the best. These conditions include energy and raw materials costs, good research and development opportunities and a highly skilled workforce. For example, production costs in Asia and Latin America are lower and the market growth higher than in markets in Europe.

Sweden’s position on the market is therefore strong. But the growth rate in other countries has been faster. Paper production is growing fastest in China, whilst pulp production is growing fast in China, Indonesia and Brazil.

In terms of paper consumption, India, China, Russia, Eastern Europe, the Middle East and Africa are showing the highest growth rate. In countries with mature markets, growth in demand is generally lower, sometimes even contracting.

THE IMPORTANT INVESTMENTS
The forest industry invests on average around SEK 123 billion during 2009.

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THE IMPORTANT INVESTMENTS
The forest industry invests on average around SEK 10 billion a year, equivalent to more than 15 percent of Sweden’s total industrial investments. In recent years, the investments have fallen. If the industry is to keep its leading position on the international market, this trend must be broken. The paper machines used in Sweden are of a high technical standard but, in order for them not to be superseded by new machines in other parts of the world, it is vital that we continue to invest in Sweden. A large proportion of the investments relate to environmental measures and energy efficiency. Investments are also being made in new, large sawmills.

STRONG ON THE MARKET
Swedish forest industry is highly export oriented and exports during the recession have benefited from the weak krona. Sweden is the second biggest exporter of pulp, paper and sawn products in all. Only Canada is bigger. Swedish forest product exports amounted to SEK 123 billion during 2009.

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OUR APPROACH FOR ECONOMIC RESPONSIBILITY

EMPLOYMENT AND LOCAL IMPORTANCE

The forest industry is very important to employment in many Swedish counties. The recession has resulted in several mills and sawmills reducing their workforce and some have also been forced to close down. Hopefully, these savings will contribute to increased competitiveness in the future.

THE FOREST INDUSTRY – A STRONG LIFELINE

In some counties in Sweden, the forest industry provides 20-30 percent of the industrial employment and 25-50 percent of the industrial production value. The forest industry is therefore a very important employer, particularly in the forest-rich and sparsely populated counties of northern and central Sweden.

In smaller towns and villages, the paper mill or sawmill may be the main employer. Tax payments from the employees contribute to the municipal budget, their purchasing power benefits local businesses and their families form the population basis required to run schools and childcare. Other companies in the town are usually dependent on the paper mill or sawmill in question.

MANY INDIRECT JOB OPPORTUNITIES

The forest industry does not just generate direct employment. For each direct job opportunity, the forest industry creates around two indirect jobs, be they in forestry, transport, chemicals or the consultancy industry. According to the employers’ organisation Almega and Unionen trade union, the forest industry provides the highest number of indirect work opportunities compared to all other industries in Sweden, on a relative basis.

TOUGH BUT NECESSARY DECISIONS

Many smaller communities have been hit hard by cutbacks in the forest industry. Cutback decisions were difficult for companies to make, but deemed essential in order to reduce costs and remain competitive. It is estimated that around 1 000 people lost their jobs in the pulp and paper industry during 2008-2009, along with some 500 people in the sawmill industry. Since 2007, a total of about 4 000 people have been affected by cutbacks or closures in the forest industry.

The industry strives to implement staff lay-offs in a responsible way. Redeployments and early retirements can reduce the number of redundancies. To support those who lose their jobs, many companies offer training grants and access to a personal coach as support in their search for future employment. Employees are covered by collective bargaining agreements and the closure processes are implemented in consultation with trade union organisations.

POSITIVE LONG-TERM DEVELOPMENT

The industry believes that the tough savings and structural changes will contribute to long-term competitiveness. In the future, products based on renewable raw materials will be more attractive than many fossil-based, energy intensive and climate affecting materials, which will benefit the development of the industry.

PROPORTION OF COUNTIES’ INDUSTRIAL WORKERS EMPLOYED IN THE FOREST INDUSTRY

Source: Statistics Sweden
More than half of the timber from Swedish forests goes to the sawmill industry, primarily for the manufacture of sawn products. After Canada and Russia, Sweden is the biggest exporter of sawn products and, despite the recession, those exports increased by two percent during 2009. The industry is constantly working to improve the characteristics of timber products. For example, research is being conducted in construction timber, and major advances have been made in eliminating defects such as cracks or deformations that occur when timber products are dried. In addition, today’s modern timber bridges require minimal maintenance.

Wood is one of our most important building materials, and consumption in Sweden is at a constantly high level. It is now possible to use wood in several different types of constructions, including multi-storey buildings, halls and bridges.

**SAWN PRODUCTS**
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The industry is constantly working to improve the characteristics of timber products. For example, research is being conducted in construction timber, and major advances have been made in eliminating defects such as cracks or deformations that occur when timber products are dried. The forest industry is also investing significant resources into standardising wood and timber products in order to create efficient construction systems.

Wood is one of our most important building materials, and consumption in Sweden is at a constantly high level. It is now possible to use wood in several different types of constructions, including multi-storey buildings, halls and bridges.

**PULP AND PAPER**
The fibre raw materials used in pulp and paper manufacture are either fresh fibre from the forest or recovered paper. Fresh fibre is used to manufacture mechanical pulp and chemical pulp. These two processes give different qualities of pulp and paper products. Mechanical pulp is primarily used for newsprint, telephone directories and brochures. Chemical pulp is used in printing and writing paper and various forms of packaging.

**STRETCHABLE FIBREFORM® – AN INNOVATION IN PAPER**
Billerud has launched a packaging paper that has a high level of elasticity – up to 20 percent, compared to the 2-4 percent of standard paper. The paper, which is called Fibreform, is made from recycled wood. It is a product that has experienced strong growth. After a break of 30 years, research into viscose has now re-started in a project run by Domjs Fabrikker, Umeå University, Akzo Nobel, Processum and research company More Research. By analysing viscose, Domjs Fabrikker hopes to improve and further adapt cellulose for use in the textile industry. The market for textile fibres is currently dominated by oil-based materials such as polyester, followed by cotton. The idea is that clothes made from viscose could increasingly replace textiles that are based on oil, thereby further reducing our oil dependency.

**CLOTHES FROM THE FOREST**
Relatively few people are aware that viscose, which is used as a fibre in fabrics and textiles, is based on cellulose derived primarily from forest. It is a product that has experienced strong growth. After a break of 30 years, research into viscose has now re-started in a project run by Domjs Fabrikker, Umeå University, Akzo Nobel, Processum and research company More Research. By analysing viscose, Domjs Fabrikker hopes to improve and further adapt cellulose for use in the textile industry.

**BIOENERGY PRODUCTS**
The forest industry is producing an increasing amount of bioenergy products. This includes branches and tree tops, pellets, surplus heat used for district heating and electricity from back-pressure power production. In addition to these bio-based products, many companies have recently invested in expanding wind power – both in industrial plants and for more efficient use of forest land.

**OUR SUSTAINABLE PRODUCTS**
A SELECTION OF FOREST INDUSTRY PRODUCTS

Forest industry products play an important role in society. They are made from renewable raw materials and can be recycled, both as material and as energy. As technology and research advances, they are also becoming increasingly sophisticated.

**SAWN PRODUCTS**

**PULP AND PAPER**

**STRETCHABLE FIBREFORM® – AN INNOVATION IN PAPER**

**CLOTHES FROM THE FOREST**

**BIOENERGY PRODUCTS**
Resource use in the forest industry is efficient. Forestry, pulp and paper mills, sawmills and bioenergy production form an industrial system in which forest raw materials are utilized in a very high degree.

Different parts of the tree are used to manufacture different products. Even by-products are used to their maximum effect, primarily in energy production.

During 2008, 74.9 million m$^3$ solid volume under bark of forest raw material was used in the Swedish forest industry.

The forest needs the sun to grow. Through photosynthesis, trees convert sunlight, carbon dioxide in the atmosphere and water in the ground to wood. Carbon dioxide is stored in the trees in the form of carbon compounds. Of course, trees and soil release some carbon dioxide, but they absorb considerably more. This is why the forest plays a key role in limiting the greenhouse effect.

Forest products such as sawn products and paper also contain carbon compounds that were once absorbed by trees in the form of carbon dioxide. These compounds are stored for the entire life time of the products.

When forest products have served their time and are used as bio-energy or are composted, the carbon dioxide is released. But, in contrast to climate affecting emissions from fossil fuels, incineration of forest products does not release additional amounts of carbon dioxide into the atmosphere.

The carbon dioxide released is instead absorbed through photosynthesis by replanted and growing trees. This closes the circle and a new carbon cycle can begin.

Swedish forests and forest products absorb and store more carbon dioxide than all fossil carbon dioxide emissions produced in Sweden. This has been demonstrated in the Lustra research programme, where researchers from SLU (Swedish University of Agricultural Sciences) and Mid Sweden University have mapped how the Swedish forest influences the amount of carbon dioxide and other greenhouse gases in the atmosphere.

Forest raw materials are utilized to a very high degree. Different parts of felled mature trees, as well as small-dimensioned and thinning trees, are used to manufacture different products.

The forest is part of a natural cycle with a renewable raw material. The entire tree is used in an efficient industrial system. Efficient use of raw materials is essential for sustainable development. In addition, the forest and the forest industry also have a key role to play in respect of the climate, as renewable products can replace their fossil-based counterparts.

Forest industry products form part of the carbon cycle.

TWO TYPES OF CARBON DIOXIDE

Biogenic carbon dioxide is released when trees and wood based products rot or are incinerated. The carbon dioxide given off is already part of the atmospheric carbon cycle.

Fossil carbon dioxide is released when oil or coal is incinerated. This process releases new carbon dioxide into the atmosphere, contributing to the greenhouse effect.
OUR SUSTAINABLE PRODUCTS

WOOD AND ITS ADVANTAGES

Carbon Footprint is a measure of the amount of greenhouse gases a business or product causes. It is becoming more common for organisations and companies to evaluate their carbon footprints in order to determine how they can reduce their climate impact.

More and more organisations, companies and authorities strive to reduce their carbon dioxide emissions. A first step in this process can be to do a carbon footprint assessment, i.e. to calculate how much carbon dioxide the operations generate during all phases of manufacture.

CARBON FOOTPRINT OF WOOD PRODUCTS

The term “carbon neutral” is used for something that has a zero carbon footprint. Wood products from sustainable forestry have a negative carbon footprint during their life time, which means that they absorb more carbon dioxide than they release.

In order to determine the carbon footprint of building materials and other wood products, the industry has taken an initiative to develop tools called “Carbon Calculators”. Using these tools, companies can, in a uniform, transparent and credible way, report the carbon footprint from a product or design and, to a certain extent, compare it with other materials.

WOOD BUILDING SYSTEMS INCREASE

The climate benefits of timber becoming manifest in areas such as building constructions, and timber construction is increasing in Sweden. Sixteen municipalities have invested considerable resources in building with wood by joining the project Trästad (Timber City) 2012. The project aims to develop Swedish expertise and technology, and in the long term create a European and global market for modern industrial timber construction technology.

RECOVERY

Sustainable cycles are based on recovered products, either through materials recycling or energy recovery. Paper recycling ensures that forest raw materials are used in an efficient way and reduces the amount of waste in society.

Compared to most other countries, Sweden has a high level of collection of recovered paper. In 2008, total paper collection in Sweden amounted to more than 1.6 million tons. Some recovered paper is also imported. 77 percent of all packaging and newspapers were recycled, which is the highest level since the producer’s responsibility for packaging and newspaper was introduced in 1994. In 2008, the Swedish paper industry used around 2 million tons of recovered paper in the production, equivalent to 34 percent of the fibre. In addition to this, most untreated wood products in Sweden are either re-used or recovered, primarily as energy.

In Europe, 2008 the target of 66 percent recycling of paper was achieved – two years ahead of schedule. In Sweden, this level was achieved some time ago, but the Swedish forest industry continues to contribute to increasing collection levels in Europe through a variety of initiatives.

SWEDISH FORESTS SUPPLY EUROPE WITH FRESH FIBRE

A recycling level of 100 percent is not achievable, as the quality of paper degrades each time it is recycled. That is why new, fresh fibre must continually be added. In Sweden, there is plenty of forest. Therefore, it is natural that the Swedish pulp and paper industry for the most part uses new, fresh fibre in its production. The Swedish forest industry supplies Europe with pulp and paper from fresh fibre. This paper is largely recycled in Europe, where paper manufacture is based to a great extent on recovered paper.
OUR SUSTAINABLE PRODUCTS

RESEARCH

Sweden is a strong country in respect of forest and forest products research, and competing forest companies collaborate within research and development. The research is about improving economic and ecological sustainability, developing efficient paper and packaging solutions and working for a beneficial research strategy.

LARGE RESEARCH VOLUME IN SWEDEN

Forestry industry research in Sweden is held in high regard on the international stage, and the resources invested are comparatively large. Annually reported forestry and forest industry research in universities, technical colleges and research institutes have increased with SEK 200 million since 2005, and is now around SEK 1 billion per year.

SWEDISH FORESTRY AND FOREST INDUSTRY R&D AT UNIVERSITIES, TECHNICAL COLLEGES AND INSTITUTES, 2008

NRA – A NATIONAL RESEARCH AGENDA

NRA sector is the national research agenda for the forest industry. It has been developed jointly by the forest industry, forest owners, government financing agencies and Swedish research parties. NRA is an important tool for developing products with a higher added value and for identifying new business opportunities for the forest industry. Through NRA, research resources can be coordinated and focused on strategically important areas where there is potential to become world class.

SWEDEN AT THE FOREFRONT

Four major EU research programmes have been coordinated by Swedish research institutes. SustainPack and EcoTarget were coordinated by Invenia (formerly STFI-Packforsk). SustainPack dealt with sustainable packaging technology, whilst EcoTarget’s objective was to streamline the pulp and paper industry so that “more can be produced with less raw materials”.

Skogforsk managed Eforwood, which sought to evaluate and develop the forest industry’s contribution to sustainable development. SI Trätek coordinated Indisputable Key, with the purpose to improve the traceability of forestry and the sawmill industry.

All four projects came to an end during 2009 and the results were presented at FTP’s (Forest-Based Sector Technology Platform) conference “From Research to Business”, held in November 2009 in Stockholm. The results are now being applied by the industry.

TODAY’S RESEARCH BECOMES TOMORROW’S BUSINESS

The climate issue presents the forest industry with many opportunities. Research is underway with opening up entirely new business areas for more climate adapted products. With the help of cutting-edge research, pulp mills can contribute to the production of future automotive fuels and cellulose-based chemicals. In addition, packaging and hygiene products can be produced from highly processed fibers, wood polymers and composite materials.

In order to fully succeed in terms of research, collaboration with other industries and research areas such as IT, biotechnology, nanotechnology and materials technology is necessary. Research funds also need to be ploughed into collaboration between public and private sector players. The objective of increasing forest industry research and development investments at universities, technical colleges and institutes by 50 percent by 2012 is based on public funds being invested into joint research projects involving both business and public sector players.

WHAT IS STAR-COLIBRI?

Star-COLIBRI is a major strategic initiative to support European collaboration within the bioforestry sphere. It will also support break-through innovations by speeding up and facilitating industrial use of research results.

The short term aim of Star-COLIBRI is a “clustering of stars” – i.e. identifying and collecting important research projects, supporting them to become successful and acting as role models for other projects.

Star-COLIBRI is coordinated by the forest sector technology platform FTP (Forest-Based Sector Technology Platform). FTP is a European partnership for research and development. In addition to FTP, four other technology platforms are also represented in Star-COLIBRI. In total, Star-COLIBRI’s consortium consists of 11 partners.

READ MORE ABOUT THE RESEARCH PROGRAMMES AND THE RESULTS:

NRA: www.nra-sweden.se
SustainPack: www.sustainpack.com
Indisputable Key: www.indisputablekey.com
Eforwood: www.eforwood.com

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Swedish forestry and forest industry R&D at universities, technical colleges and institutes, 2008
OUR AGENDA FOR FOREST MANAGEMENT

YIELD AND GROWTH

Swedish forests are managed with focus on long-term sustainability and the volume of growing forests has gradually increased over the past century. The forest provides renewable raw material for products that can be recycled and used as bio-energy at the end of their life time.

HIGH FOREST GROWTH IS GOOD FOR THE CLIMATE

The Swedish government states in the 2006 forestry report “Mervärdesskog” (Forest Added Value) that: “The forestry has a decisive role to play in terms of reducing Swedish dependency on oil and thus emissions of greenhouse gases.”

In its findings, the report addresses many methods to increase the growth and the uptake of carbon dioxide in the forest, including:

- afforestation on abandoned arable land
- extend forest fertilisation
- clean old ditch systems
- use the best possible plants and regeneration methods
- increase the cultivation of new, highly productive tree species

“The government believes that high and stable growth is a fundamental starting point in making use of the forest’s role in combating global warming. High growth counteracts climate change by increasing carbon uptake in growing forests and land and in various forest products, as well as through increased biofuel production.”

A high growth in the forest is favourable from a climate perspective. Felled trees produce renewable raw material for timber and paper products or a raw material that can replace finite or more energy intensive materials and fossil fuels.

Raw materials from the forest are part of the carbon dioxide cycle. Immediately after harvesting, carbon dioxide starts to leak as harvest residues such as branches and needles start to decompose. Once the new trees reach the age of around 20, they are able to absorb more carbon dioxide than the amount that leaks from the ground. Trees are felled when their growth decreases and they are then used as raw material for products that can replace more climate affecting materials and types of energy. Using the forest is therefore good for the climate. Picture source: Holmen.

THE CLIMATE AFFECTS THE FOREST

According to the Swedish Commission on Climate and Vulnerability (SOU 2007:60), the greenhouse effect will have a major impact on the Swedish forestry. The growth of pine, spruce and birch may increase markedly, but with the warmer climate the risk of damages from storms, fires, fungi and insect attacks increases as well. It is still too early to estimate the magnitude of potential climate changes.

MORE AND MORE BIO-ENERGY

By using bio-energy instead of fossil energy, we reduce the climate change effect. The amount of bio-energy extracted from the forest, in the form of branches and smallers trees that previously have been left in the forest, may in the future be possible to use stumps and tree tops, has substantially increased and is now around 7 TWh per year. In addition, there is unused potential of about 8 TWh. Due to increased demand for bio-energy, it may in the future be possible to use stumps and smaller trees that previously have been left in the forest. Doing so, an additional 12 TWh could be produced.

In the long term, it is estimated that bio-energy extraction from the forest could increase by 20 TWh.

When more bio-energy is extracted from the forest, more nutrients are also extracted from the forest soil. One way of counteracting this is to re-circulate ash from the incineration of bio-energy. The ash contains all the important nutrients, apart from nitrogen, and may also prevent the acidification of the soil.

THE SWEDISH WOOD EFFECT, SWE

The total amount of forest in the world is reducing year on year, but in Sweden the situation is the reverse. The growth of Swedish forests is larger than the cutting yield, resulting in an increasing timber volumes in the forest with around 1% per year. Estimates show that if all forests globally were managed in the same way, with greater growth than harvest, emissions of fossil carbon dioxide equivalent to the current global emissions level could be taken up and stored in forests and wood products by 2050.
Today, trees and groups of trees are always left in the harvesting area after felling in order to protect the biodiversity. The trees saved are mainly those with atypical characteristics, such as dead and old trees, deciduous trees and bushes and lying trees. In the long term, this will increase the amount of deciduous trees, dead and big trees in the forest, which will benefit insects, fungi and other organisms.

**CERTIFICATION**

In order to facilitate for consumers, companies and authorities to get information about the origin of timber and to guarantee that it has been produced in a responsible manner, there is certification systems for forestry. All of The Swedish Forest Industries Federation’s member companies that own forests are certified in accordance with FSC (Forest Stewardship Council) and/or PEFC (Programme for the Endorsement of Forest Certification schemes). FSC certification is common amongst larger forest companies, whilst PEFC is more common within small scale forestry. Many companies are certified against both.

Both these systems are tougher than the Swedish Forestry Act, featuring requirement such as:

- areas with rare plants and animal species must be preserved in order to protect local biodiversity
- the forest owners set aside 5 percent of their forests voluntarily to preserve and create natural values for the future
- requirements for education, safety and job security for those who work in the forest
- forests are managed with consideration to other interests using the forests
- considerations are given to ancient remains and cultural sites.

Forest products may be marked with the FSC or PEFC logo. In order to do this, a certificate is required that guarantees that the origin of the raw material has been established and that it satisfies certain requirements. These so called traceability certificates are issued by an independent inspector.

**SÖDRA AND GREEN FOREST MANAGEMENT PLAN**

Mangering the forest is a big responsibility and commitment. It must be managed in a sustainable way and the raw materials produced must be of good quality. In addition, consideration must be given to the forest’s other values for environment and recreation. It is not always obvious how this should be accomplished in practice, but as early as 1996 Södra developed a method and product that is now an intrinsic part of forest ownership.

The product is called Green Forest Management Plan and is drawn up exclusively for each property. It gives the forest owner a comprehensive picture of the production and nature values of the property. The management direction for each individual forest department is determined using four target codes. This allows the forest owner to know in advance where to invest in timber production and where the highest nature values are and how they should be managed. The plan also forms a base document of forest certification and, in this respect, is the forest owner’s most important tool for conducting sustainable forestry where production and environment exist in harmony. In 2008, CEPI (Confederation of European Pulp Industries) chose Södra’s Green Forest Management Plans as one of the best planning tools for responsible forestry in Europe.

Both these systems are tougher than the Swedish Forestry Act, featuring requirement such as:

- areas with rare plants and animal species must be preserved in order to protect local biodiversity
- the forest owners set aside 5 percent of their forests voluntarily to preserve and create natural values for the future
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**OUR AGENDA FOR FOREST MANAGEMENT**

**BIOLOGICAL DIVERSITY**

The forest industry is investing major resources in preserving the biodiversity of the forests. For example, after felling, all dead trees are left in the forest and groups of deciduous trees are preserved in order to benefit the flora and fauna that are dependent on these habitats.
THE FOREST INDUSTRY’S OBJECTIVES:

- Energy efficiency in the forest industry shall be improved by at least 15 percent by year 2020.
- The forest industry’s own electricity production shall increase by 2 TWh by year 2020.

OUR CONCERN FOR THE ENVIRONMENT

ENERGY

The forest industry’s processes are energy intensive, both in terms of electricity and heat, but considerable efforts are being made to achieve efficiencies. The industry has adopted a zero vision for the use of fossil fuels in manufacturing processes and 90 percent of the heat requirements are already met by bio-energy. The forest industry also produces bio-based back-pressure power and renewable wind power.

In total, the forest industry used approximately 21 TWh of electricity in 2009, corresponding to 15 percent of the total electricity use in Sweden. For an electricity intensive industry like the forest industry, electricity costs constitute a major part of the production costs. Because of this, considerable efforts have been made to streamline the energy use and increase the production of self-generated electricity. Today, more than a quarter of the electricity used by the industry is self-generated and based on bio-energy.

ELECTRICITY USE, PULP AND PAPER INDUSTRY 2009

The forest industry itself uses a lot of bio-energy in the form of bark and spent liquor produced during the production process. A large part of the forest’s energy range, such as branches and tree tops, is also supplied to thermal power plants for electricity and heat generation. In addition, the industry also supplied about 2 TWh of heat to the municipal district heating networks during 2009. These deliveries could double by opening up district heating networks for third party access (TPA) and making upgrades in the mills.

In addition, some companies are investing in wind power. In Skutskär, Vindin All (co-owned by 10 electricity-intensive base industries) built a wind power station during autumn 2009. The power generated will be used in Stora Enso’s pulp plant. Other examples include SCA and Statkraft, which have plans to use wind power to generate 2.8 TWh of electricity. Holmen and Norrtelje Energi plan to produce 100 GWh and Södra Skogsägarna 140 GWh.

PFE – A SUCCESS STORY

The program for improving energy efficiency (PFE) was launched by the Swedish Energy Agency in 2004. It is aimed at Swedish energy intensive industrial companies and shall contribute to increasing companies’ energy efficiency. Through PFE, companies can get tax reductions for the electricity they use, provided that they streamline and work structurally on their energy use. The Swedish Energy Agency reports that participating companies managed to cut their annual electricity consumption by 1.4 TWh during the first programme period (2005–2009). Of this reduction, the forest industry’s 55 participating companies account for around 63 percent, or 0.9 TWh.

This is 50 percent more than was estimated at the start of the programme.

In addition, the program also brings about cost reductions in the companies’ own facilities, although 5 percent is also supplied to the main network.

The production of pulp and paper requires huge amounts of energy in the form of steam and electricity. The steam is produced in recovery boilers (where spent liquor is heated) or solid fuel boilers (where material such as bark is burned). Electricity can be generated by allowing the produced steam to pass through a turbine. The steam that has passed through the turbine has a lower pressure, but can be used in production processes. Generating electricity in this way, by using residual steam to satisfy the energy needs of the process, makes the total energy use very efficient.
OUR CONCERN FOR THE ENVIRONMENT

PROCESSES

The forest industry started their environmental efforts in the 1970s, quickly reducing emissions to air and water. Nowadays, the environmental work is characterised by a holistic perspective, where raw materials, energy, waste and transportation are also taken into account. The industry today is resource efficient and emissions are low, but the industry’s environmental adaptation is set to continue.

The forest industry’s statement of intent establishes that environmental efforts shall be focused on achieving continual improvement. Measures must be taken, both as a result of legislation and through corporate decision-making. For the past 40 years, the industry has also run joint environmental projects in order to increase knowledge and awareness.

CONSCIOUS WATER USE

Population growth, migration to urban centres and increased industrialisation have resulted in an increasing need for clean water in some parts of the world. However, Sweden is a country with good access to quality water.

Pulp and paper production requires a relatively large amount of water. Despite the fact that water is not a scarce commodity in Sweden, the Swedish forest industry still looks to reduce its water usage as this also leads to reduced energy consumption in the processes. The amount of water required is primarily reduced by further closing the systems in the manufacturing process, i.e. recirculating and reusing more process water.

The Swedish forest industry takes all its water straight from lakes and watercourses and does not use groundwater. After use, the purified process water is returned to the watercourse.

In sawmills, only a limited amount of water is used, primarily for timber watering. This takes place in climate-controlled sprinkler systems, and the water is recycled, usually in closed systems.

WATER TREATMENT AND EMISSIONS TO WATER

Pulp and paper mills reduce emissions to water partly by implementing measures in their processes, and partly by treatment of effluents. Today, more than 95 percent of the effluent is treated in two or three stages before being returned into the watercourses.

REduced emissions to air

The forest industry’s carbon dioxide emissions from fossil fuels have been reduced significantly since the early 1990s as oil continues to be phased out in favour of bio-energy. The reduction in oil use and the lower sulphur content in the oil have, in combination with improved combustion technology and more efficient purification equipment, reduced sulphur emissions to air by 95 percent since the beginning of the 1980s. However, it has not been possible to reduce emissions of nitrogen oxides to the same extent. Various methods have been studied, but there is currently no cost-effective technology to reduce emissions of nitrogen oxides from recovery boilers.

IN THE FOOTSTEPS OF WATER

The market is increasingly demanding information about companies’ water consumption or “Water Footprint”. At CAPI (Confederation of the European Paper Industries) a project is underway to devise a joint methodology for calculation of the use of water in production processes and forestry.

During 2009, the industry gave IVL, the Swedish Environmental Research Institute, the assignment of mapping the flows in the Swedish forest industry based on common definitions and indicators, thereby illustrating the current situation of water in the industry.

NEW AND EXTENDED EFFLUENT TREATMENT PLANTS AT SCA MUNKSUND AND HOLMEN IGGESUND

SCA’s paper mill in Munksund commissioned its new plant for the purification of outgoing process effluent in 2009. It is a biological treatment plant, where microorganisms are used to clean the water. Thanks to the investment of SEK 223 million, emissions of organic material into the water have been reduced by about 70 percent. Approximately 3–4 tons of bio sludge per day are incinerated in the mill’s solid fuel boiler.

Holmen Iggensund has invested SEK 256 million in an improvement of its treatment plant. The existing mechanical and biological treatment stages have been completed with a stage of chemical flotation. This means that emissions of phosphorous, nitrogen and dissolved organic substances are reduced, helping the already eutrophicated Baltic Sea. The water released into recipient will also be clearer. This is a real benefit as sunlight can reach the bottom better, which in turn will benefit plant and animal life.

The plant was taken into operation in autumn 2009.

ODour FROM THE PROCESSES

During the manufacture of sulphate pulp, sulphur compounds are produced, which have a bad odour even at very low concentrations. For a long time, all mills have had systems for collecting and burning bad-smelling gases from their major sources. More and more mills are now installing systems that also collect gases from minor sources such as diffuse emissions from storage tanks.

WASTE CAN BE RE-USED IN A MANY WAYS

About 95 percent of the waste produced in pulp and paper mills is recovered in some way, and only five percent is sent to landfill. Companies are striving to further reduce this figure. Most waste goes to energy recovery in the mills’ solid fuel boilers. Other areas of use include construction of new storage tanks, recycling of forest and agricultural land. Attempts are being made to rot sludge from the mills’ effluent treatment plants to produce biogas.

Many forest industry companies are responsible for land where activities were conducted in the past. Although fully compliant with practice and environmental requirements of the time sometimes the land must be decontaminated, which may claim for considerable resources. Through investigations in consultation with the environmental authorities form the basis for how this is to be done.
OUR CONCERN FOR THE ENVIRONMENT

TRANSPORTS

Through its large export volumes, the forest industry is a driving force of the Swedish economy and transports are essential for a growing market. The exports lead to the industry carrying large volumes internationally, in addition to transporting significant quantities of raw materials and products within Sweden. All this brings about emissions that impact the environment.

The forest industry is using ship, train and lorry transports in combined logistical solutions.

Reducing emissions of fossil carbon dioxide from transports by 20 percent is difficult, but necessary with respect to the climate. This objective shall be achieved by improving logistics solutions and by imposing requirements on transport providers.

In order to facilitate calculation of transport related emissions, and to ensure that a common methodology is applied by companies, the industry has produced a guide and a calculation template.

TAKING THE LEAD ON RAIL

The forest industry is the sector in Sweden that transports most goods on rail. Between 2001 and 2008, timber transports on rail increased by 75 percent – and it continues to increase. However, it is being held back by technical and administrative deficiencies in both the Swedish and the European railway systems.

INTELLIGENT ROAD CHOICE

The fuel constitutes 30–40 percent of the hauliers’ total costs. By more efficient planning, management and follow-up, the fuel consumption and environmental impact may be reduced, and traffic safety may be increased. Therefore, the industry promotes timber exchanges between forestry companies and optimisation in both directions.

REduced FUEL CONSUMPTION

Low fuel consumption has been given highest priority for reducing emissions from transports. As part of that effort, the industry tests newly-developed engines, hybrid solutions and resource and climate efficient fuels. For example, the world’s first forest machine to use an electricity-diesel hybrid engine has been developed – the El forest. It uses 35 percent less fuel than a standard forwarder.

LONGER VEHICLES – LESS EMISSIONS

In order to improve the environmental efficiency of timber transports, the industry is conducting research and development in respect of special vehicles – the so called ‘ETT project – Modular system for forest transports’. In the sub-project “One more stack”, the vehicle used is both longer and can take a heavier load than standard vehicles. This means that three timber vehicles can be replaced by two, giving fewer trucks on the roads, reducing emissions and increasing traffic safety. Initial results show that carbon dioxide emissions are reduced by 23 percent. Because the ETT vehicle has more axles than a traditional timber vehicle and the load per axle is lower, road wear is also reduced.

RESPONSIBILITY AS A TRANSPORT PURCHASER

The forest industry is Sweden’s biggest purchaser of transport services. By developing common sustainability criteria for the procurement process, the industry supports the development of more efficient and cleaner vehicles and vessels.

Many companies in the industry participate in various projects to ensure responsible procurement of transport services. In the case of maritime transport, there is the Clean Shipping project, which aims to create an environmental index where shipping lines can be environmentally assessed. Another example is the non-profit organisation QIII, which assesses procurement of road transport services, focusing on health, safety and the environment. Stora Enso and Setra are involved in both these projects. Other initiatives include the Forum for Sustainable Transport, in which Södra and Billerud participate, and KNIG – Climate neutral road transport, in which SCA and Stora Enso are involved.

INFOGRAPHIC

The forest industry’s objectives:

- By 2020 the forest industry shall have reduced its emissions of fossil carbon dioxide from transports by 20 percent.
- The forest industry shall develop common sustainability criteria for the procurement of transport services by year 2010.

The Swedish Forest Industries Federation is QIII’s first supporting member.

THE FOREST INDUSTRY’S OBJECTIVES:

- By 2020 the forest industry shall have reduced its emissions of fossil carbon dioxide from transports by 20 percent.
- The forest industry shall develop common sustainability criteria for the procurement of transport services by year 2010.

Sensible Transport Solutions at Smurfit Kappa Kraftliner

Smurfit Kappa Kraftliner in Piteå is the biggest kraftliner producer in Europe, with an annual capacity of 700,000 tons. The majority of this, around two thirds, is transported by ship using an efficient system solution with return goods from Holland and waste paper from the Baltic States. Around one third of the products are transported by rail. The rail transports are coordinated with Korsnas, Billerud, Monds Dynas and Setra, and travel with goods in both directions.

Spent liquor (black liquor) from Smurfit Kappa’s pulp production process was the first in the world to be gasified in a black liquor gasifier, and now the world’s first pilot plant for production of bio-based DME is being built on the factory site. The pilot plant will be managed by Chemrec and the energy research centre ETC. Bio-DME is a renewable fuel for heavy vehicles and will be tested in trucks that will transport products from the factory to the port of Piteå. So in Piteå, you can follow the process from “wood to transport”!

Biofuels from the Swedish Forest Industry

The forest may be one of the raw materials for the next generation of vehicle fuels. In Sweden, several projects are underway that could lead to production of forest-based biofuels:

- At the bio refinery Domsjö Fabriker, timber is being processed into the factory’s main product of special cellulose, a process that also produces by-products such as ethanol and biogas that are used as vehicle fuels. Domsjö also has, together with Chemrec, long-term plans to manufacture Bio-DME.
- SEKAB is operating a test plant for the production of ethanol from forest raw materials. The process is based on enzymatic degradation of wood chips. The plant is located at Domsjö’s factory site.
- Sveaskog and Södra are partners in SunPine, a company that will produce bio diesel using tall oil, a by-product from the pulp production process.
- Chemrec is developing production of Bio-DME at Smurfit Kappa’s factory site, see information box above.

The forest industry tests newly-developed engines, hybrid solutions and resource and climate efficient fuels. For example, the world’s first forest machine to use an electricity-diesel hybrid engine has been developed – the El forest. It uses 35 percent less fuel than a standard forwarder.

Between 2001 and 2008, timber transports by rail increased by 75 percent. This has resulted in the number of truck transports falling by 77,000 loads and CO2 emissions decreasing with 19,000 tons.

The forest industry is Sweden’s biggest purchaser of transport services. By developing common sustainability criteria for the procurement process, the industry supports the development of more efficient and cleaner vehicles and vessels.
HEALTH AND SAFETY

The forest industry must, of course, offer workplaces that are safe and that encourage development. To this end, the industry has adopted a “zero vision” for work-related accidents and continues to prioritise health and safety.

Accidents, occupational diseases and health-related absenteeism have all decreased steadily over recent years. However, there have been a few fatal accidents. This is why the industry is continually working to improve safety and has adopted a “zero vision” for work-related accidents.

LESS SICK LEAVE AND FEWER ACCIDENTS

Over the past two years, total sick leave in the pulp and paper industry has decreased by over 20 percent. This is due to the implementation of more active rehabilitation programmes that feature improved procedures to handle absences. The objective is to bring the health-related absenteeism below 3.5 percent. In 2008, the absenteeism was 3.9 percent, with women representing a larger proportion than men. As a result, more efforts are currently being focused on improving women’s health.

Accident frequency, i.e. the number of accidents per number of employees, has in recent years decreased in both the pulp and paper industry and the sawmill industry. In the sawmill industry, the number of accidents has decreased by 30 percent in the past six years. The most common injuries are the result of falls, tripping and cuts. The most common work related injuries in both industries are strain injuries, followed by noise-related injuries.

NEW OBJECTIVE

In the case of work related accidents, the same objective has been set for both sawmills and the pulp and paper industry – 10 accidents per 100 employees. At the latest pulp and paper industry management conferences, held in 2007/2008, the industry adopted the objective of reducing the number of workplace accidents to half by 2010, a target proved to be only partially achievable within the short timeframe. The licence has led the industry to retain the target and extend the deadline for its achievement to 2015. The current average age in Swedish manufacturing industry is 1.1 accidents per 100 employees.

ACTIVE SAFETY WORK

In order to reduce health-related absenteeism and the number of accidents, a systematic programme of health and safety is underway in the industry. Particular emphasis is being placed on taking steps to address behaviour-related accidents and to develop corporate safety cultures. For example, Setra has introduced a training programme for a “safety driving licence”. The licence states which elements of the area by performing a safe stop, and why such a procedure must be carried out.

The course ends with a test for which a pass mark must be achieved in order for the participant to receive their personal “safety driving licence”. The licence states which elements of the production process the employee is authorised to perform. The pilot project at Måla has turned out very well, and Setra has decided to roll out the programme to all production units.
OUR WORK WITH SOCIAL ISSUES

EQUALITY AND TALENT MANAGEMENT

Qualified and committed employees is a decisive success factor in an increasingly globalised world. The forest industry needs more women, from management level all the way down. In addition, a higher education level within the industry is needed in order to strengthen competitiveness and productivity.

Within the forest industry, we know that an even gender spread is good for the business. More female managers create role models and will, in the long run, lead to more women on all rungs of the corporate ladder.

FEMALE MANAGERS AN ASSET

In order to achieve the forest industry’s objective of at least 30 percent of all managers appointed to be women and to promote the development of women within the companies, special efforts are carried out, for example leadership development programmes and individual development plans. During 2008, almost 25 percent of appointed managers were women. Continual follow-up will ensure that the development continues in the right direction.

**DISTRIBUTION BETWEEN MEN AND WOMEN**
(total, pulp and paper industry and sawmills, 2008)

- MEN 83%
- WOMEN 17%

**SIRIUS FOR INDUSTRIAL DEVELOPMENT**

In order to meet the challenges of today and tomorrow, the SIRIUS (Skogsindustrins Råd för Industriell Utveckling i Samverkan) [Forest Industry Council for Industrial Development in Collaboration) joint council has been formed. Both employers and unions are members. SIRIUS works for:

- Better working environments – with fewer work related accidents and an improved safety culture.
- Increased competence – to meet the challenges of today and tomorrow.
- More efficient organisation – through increased integration of operation and maintenance.
- Increased diversity – for example by introducing more female operators.

**INCREASED COMPETENCE**

A company’s position on the market depends, to a large extent, on its competitiveness and efficiency. Employee competence is an important factor in this respect. The industry has therefore adopted a target of at least 60 percent of all employees recruited during 2012 having a higher education qualification. In 2008, the corresponding figure was about 45 percent.

The education level in the pulp and paper industry is increasing, as in the sawmill industry, even if the trend there is not as clear. A high education level is becoming more important in order to make the most of the ever more technically advanced production equipment.

In order to ensure the industry’s competence sourcing, consideration must also be given to demographic factors such as age structure and future generational shifts. It is therefore important to profile the industry and attract new employees.

**WOMEN ON HOLMEN IGGESUND’S TRAINEE PROGRAMME**

Holmen in Iggesund chose to start its own trainee programme when they wanted to recruit an entire group of new operators. This lead to the new employees feeling more secure in their jobs, but the program also had an unexpected and positive effect on equality; more than half of the new employees were women! Thanks to the trainee programme, 15 female operators have been recruited to Iggesund during the past two years.

- From always having a majority of male applicants for our operator jobs, it became apparent that women were more interested when we employed a larger group,” says Gunnar Elgesjö, HR Manager at Iggesund Paperboard to the Swedish Forest Industries skills provision committee’s magazine Brainpower.

Previous recruitments usually involved quick fixes, such as extending temporary posts or recruiting directly from other departments at the mill. The trainee programme, on the other hand, was a pure training initiative and part of a cohesive and well-considered recruitment strategy.
1 Strategy and Analysis

1.1 Governmental and institutional framework (continued)

2 Organisational profile

2.1 Name of organization

2.2 Structure and governance (continued)

4 Governance, Commitments and Engagements

4.1 Leadership and policy (continued)

4.2 Chair of the highest governance body

4.3 Independent or non-executive Board members

4.4 Mechanisms for shareholders and employees for submitting proposals to the Board or corporate management

5 Performance indicators

5.1 Economic performance

EC 1 Direct economic value generated and distributed

EC 9 Significant indirect economic impacts

5.2 Environmental performance

EN 1 Materials used

EN 2 Recycled material

EN 3 Direct energy use per primary energy source

EN 4 Indirect energy use per primary energy source

EN 5 Energy savings achieved

EN 8 Total water use per source

EN 12 Significant impact on the biodiversity

EN 14 Strategies, measures and plans for managing impacts on biodiversity

EN 16 Total direct and indirect greenhouse gas emissions

EN 18 Initiatives to reduce emissions of greenhouse gases and the reduction achieved

EN 20 NOx, SOx and other significant air emissions

EN 22 Total weight of waste per type and disposal method

5.3 Social performance

LA 1 Total workforce by employment type, contract and region

LA 7 Rates of injuries, occupational diseases, lost days, absence and fatalities

SOF Public policy positions and participation in public policy development and lobbying

The Swedish Forest Industries Federation’s sustainability publication has been adapted to comply with Global Reporting Initiative’s guidelines (version G3). GRI is an independent institute that has developed guidelines for sustainability reporting. The guidelines are used on a voluntary basis by companies and organisations to report on the environmental, social and economic aspects of their activities. The Swedish Forest Industries Federation considers its reporting to be compliant with GRI’s reporting level C, which has also been verified by the Global Reporting Initiative. The index shows which GRI indicators that are reported on and where the information can be found (pages in the publication or on the website).

www – The Swedish Forest Industries Federation’s website, www Forrestindustries.se

Finances

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<th>Turnover</th>
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Material, Raw Materials, Emissions

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Energy Purchased

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</tbody>
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Energy Produced

| Electricity | Pulp and Paper Industry | 21.100 TWh | Sawmill Industry | 21.100 TWh |

Emissions to Air

| Greenhouse gases from production processes | Pulp and Paper Industry | 1161 thousand tons | Sawmill Industry | 1161 thousand tons |
| CO2-Equivalents | Fossil Fuels | 545 thousand tons | SWEDISH ENERGY |
| Nitrogen Oxides (NOx) | Pulp and Paper Industry | 14 thousand tons | Sawmill Industry | 14 thousand tons |
| Sulphur Compounds (SOx) | Pulp and Paper Industry | 34 thousand tons | Sawmill Industry | 34 thousand tons |
| VOC | Pulp and Paper Industry | 15 thousand tons | Sawmill Industry | 15 thousand tons |
| Dust | Pulp and Paper Industry | 4 thousand tons | Sawmill Industry | 4 thousand tons |

Waste

| Total Amount Recycled | Pulp and Paper Industry | 1 million tons dry matter | Sawmill Industry | 1 million tons dry matter |
| Total Amount Incinerated of Which Hazardous Waste | Pulp and Paper Industry | 2.5 million tons dry matter | Sawmill Industry | 2.5 million tons dry matter |
| Total Amount Incinerated of Which Hazardous Waste | Pulp and Paper Industry | 1.7 million tons dry matter | Sawmill Industry | 1.7 million tons dry matter |
| Total Amount Incinerated of Which Hazardous Waste | Pulp and Paper Industry | 1.0 million tons dry matter | Sawmill Industry | 1.0 million tons dry matter |
| Total Amount Incinerated of Which Hazardous Waste | Pulp and Paper Industry | 0.0 million tons dry matter | Sawmill Industry | 0.0 million tons dry matter |

Workforce

| No. of Employees | Pulp and Paper Industry | 7,500 | Sawmill Industry | 1,500 |
| Health-Related Absence | Pulp and Paper Industry | 3.9% | Sawmill Industry | 3.9% |
| Accidents | Pulp and Paper Industry | 3.8% (420) | Sawmill Industry | 2.1% (279) |
| Fatal Accidents | Pulp and Paper Industry | 0 | Sawmill Industry | 2 |

Statistics Sweden, Confederation of Swedish Enterprise (2008) ** Indicates a standardised figure.

The entire forest industry, i.e. all production of timber and wood products and pulp, paper and paperboard products manufactured, employs just over 70 thousand people (source: Statistics Sweden, Preliminary CPA (FY 2008)).
carbon dioxide (CO₂). It is generated as a result of a process, but is a by-product.

Variations amongst all living things in all environments and biomass derived from the forest origin formed during photosynthesis. Examples of biomass include wood, bark, tail oil, and spent liquor. When burned, bioenergy does not increase the amount of carbon dioxide in the atmosphere provided bio-energy does not increase the amount of CO₂. The term “bio-energy” describes the fundamental principle of sustainability.

SUSTAINABLE DEVELOPMENT. The term came into international use after the UN's 1987 report “Our Common Future,” also known as the Brundtland Report. It describes the fundamental principle of sustainable development as being “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

TON KILOMETRE. A transport work measurement. Calculated by multiplying the cargo weight (in tons) by the distance it is transported (in kilometres).

TRACEABILITY. The ability to trace a product's origin during the entire process, from raw material to finished product.

PHOTOSYNTHESIS. The biological process during which green plants are developed with help from sunlight, water, carbon dioxide and nutrients.

RECOVERY BOILER. Chemical reactor for recovery of chemicals and energy from spent liquor in the chemical industry.

RECYCLED PAPER. Wood fibre from recovered paper.

REVITALISATION. Addition of fertilisers and trace elements to the forest soil.

SPENT LIQUOR. Used cooking liquor in the chemical process. Contains chemicals and wood resins. At the same time as the chemicals are recovered, the wood resins are used for energy production. Also known as black liquor.

BLACK LIQUOR. Spent liquor.

BY-PRODUCT. Product of substance that is generated as a result of a process, but is not the process' primary objective.

CARBON DIOXIDE (CO₂). Gas that is formed naturally when living organisms respire. With the help of photosynthesis, the plants transform carbon dioxide and water into cellulose. Carbon dioxide is released when anything is burned. Carbon dioxide is released when biological materials are combusted without oxygen, as in incomplete combustion, and when chemical elements containing carbon are burnt.

BIOFUELS. Fuel for transportation purposes derived from biomass, either liquid or gaseous.

BIODIVERSITY. Variations amongst all living things in all environments and ecological processes that exist in this. This includes diversity within and between species and within ecosystems.

BLIND LIQUOR. Spent liquor.

CARBON DIOXIDE. Carbon dioxide derived from bioenergy, see Carbon dioxide.

CARBON FOOTPRINT. A measure of the amount of dissolved carbon in water. Carbon dioxide is released when living organisms respire. For example coal, oil and natural gas.

COLD MACHINERY. A gas vehicle fuel produced from synthetic gas. DMIE is designed for modified diesel engines.

FOSSIL CARBON DIOXIDE. Carbon dioxide derived from fossil fuels, see Carbon dioxide.

FOSSIL FUELS. Fuels that are formed in the earth's crust over millions of years, for example coal, oil and natural gas.

FRESH PAPER. Wood fibre that comes straight from felled trees, as opposed to recovered fibre. Also known as virgin fibre or new fibre.

PFC. Forest Stewardship Council. An international forest certification system that seeks to ensure that the world's forests are used in a way that is acceptable from an environmental, social and economic perspective.

GREENHOUSE GASES. Gases that contribute to the greenhouse effect (carbon dioxide, methane, nitrous oxide, fluorinated hydrocarbons, perfluorocarbons and sulphur hexafluoride).

GRI. Global Reporting Initiative. Guidelines for sustainability reporting.

MECHANICAL PULP. Produced by mechanically separating fibres using refiners. The process requires a large external energy input. Mechanical pulp contains both lignin and cellulose, and almost 100 % of the raw material used is converted to pulp.

NITROGEN OXIDES (NOₓ). Gases composed of nitrogen and oxygen that are formed during combustion. In most cases, nitrogen oxides can form nitric acid, which is precipitated as acrid rain.

PEFC. Programme for the Endorsement of Forest Certification schemes. International certification system for forestry and timber trade.