

# Wood-based fuels

## – renewable energy assets

*Stora Enso intends to make optimal use of its considerable potential to contribute towards mitigating climate change.*

The best ways to combat climate change are by further increasing the use of wood-based bio-fuels, and by making continuous improvements in energy-efficiency. These aims are given high priority in all investment decisions.

Commitment to environmental management systems provides a sound basis for consistent and transparent monitoring of environmental

impacts. This year's environmental report is even more detailed than previous reports, as it also includes mill-specific CO<sub>2</sub> emissions (pages 26–29). Emission figures are given for both renewable and non-renewable energy sources, even though renewable fuels are considered to be CO<sub>2</sub>-neutral in the Kyoto Protocol. Carbon dioxide is by far the most important greenhouse gas where Stora Enso's operations are

concerned, so it is the only greenhouse gas monitored at Group level.

Emissions of carbon dioxide from the combustion of fossil fuels have been reduced by some 4 000 tonnes, in spite of slightly increased production. Notable contributions were made by Imatra Mill, where bio-fuels were used instead of peat, and by Port Hawkesbury Mill, where coal was replaced by gas. ▶

### Finding ways to exploit bio-fuels

Bio-fuels accounted for 62% of the Group's energy production in 2002 (60% in 2001). The most important bio-energy sources are black liquor from chemical pulp production, logging residuals and bark. Stora Enso units are continuously looking for new and more efficient ways to utilise residuals and by-products:

- At **Port Hawkesbury Mill** the share of bio-fuels increased by 8% during 2002 and TMP steam recovery increased dramatically from 13% in 2001 to 29% in 2002. The boiler now only uses marginal amounts of fossil fuel. Fuel oil and natural gas have been replaced by bark, sludge and sawmill residuals.

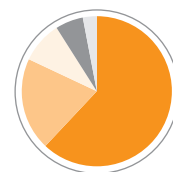
- At **Wisconsin Rapids Pulp Mill** improvements in bark and wood-waste processing and conveying systems have enabled the increased use of these residuals as bio-fuels. This has led to a 30% increase in the use of bio-fuels in the

mill's boilers since the project was implemented in August 2002.

- In co-operation with Svensk Brikett Energi AB, Stora Enso Timber has installed a new facility for producing wood briquettes from shavings and dry chips at **Gruvön Sawmill**. As well as creating a clean and highly processed fuel, locating briquette production at the planing mill reduces transportation between the sawmill and end-users by approximately a third, since volumes are smaller when transporting briquettes.

- **Tolkkinen Sawmill** in Finland purchases its thermal and electrical energy from the local municipal power plant, which is situated on the mill site. In 2002 this power plant started to run exclusively on bio-fuels, including bark and other wood residuals supplied by the sawmill.

TOTAL CONSUMPTION OF FUEL IN STORA ENSO'S ENERGY PRODUCTION IN 2002, TJ



● Bio-fuels	62%	● Oil	6%
● Gas	20%	● Peat	3%
● Coal	9%	Total 211 500 TJ	

Bio-fuels already account for some 62% of the Stora Enso Group's total annual fuel consumption of 211 500 TJ. Combined heat and power production covers 33% of the Group's total electricity consumption of 22.5 TWh.



Bark, sawdust, black liquor and logging residuals are all important wood-based energy sources. During 2002 Stora Enso found new ways to use these CO<sub>2</sub>-neutral bio-fuels.

Stora Enso North America completed its first round of energy-efficiency audits during 2002, following similar procedures to those applied earlier in European units. It is vital that continuous improvements are sought in everyday operations, as can be seen from the case of Stevens Point Mill, where electricity consumption per tonne of product has been reduced by 3% through installing new energy-efficient lighting fixtures, and by shutting down non-essential equipment.

Sawmills in general have many good opportunities both to use bio-fuels to meet their own energy needs, and to provide cost-efficient energy

solutions more widely within the Group.

#### **Taking advantage of new market mechanisms**

Stora Enso is both a large user of energy and a large producer of electricity and heat generated from bio-fuels. These aspects of the Group's operations make it vital to follow and understand emerging market mechanisms related to climate change. Stora Enso has therefore resolved to participate actively in such initiatives.

Stora Enso's North American operations are to participate in the Chicago Climate Exchange (CCX), which

aims to create an active marketplace to reduce the cost of carbon dioxide emission reductions. This participation will provide the company with valuable knowledge and experience regarding the design and operation of a market-based greenhouse gas emissions banking and trading programme.

The CCX is a self-regulatory exchange that will administer a voluntary, pilot greenhouse gas emission reduction and trading programme in North America and Brazil.

An unprecedented private-sector-designed process has produced an agreement, known as the Chicago

Stora Enso is creating new CO<sub>2</sub>-neutral new products to replace products based on non-renewable raw materials. CD/DVD disc box sliders made of carton also keep customers' transportation costs down, since they are lighter than the conventional plastic boxes.

Accord, that lays out the rules of this emissions trading programme. The CCX is unique among emerging greenhouse gas cap and trade programmes in that it is comprehensive, and involves multiple industries, emission sources and carbon sinks.

The core of the CCX is a voluntary commitment taken by members to reduce greenhouse gas emissions during the years 2003–2006 to a level below a historical baseline. This commitment covers multiple gases and multiple industrial sectors, is international in scope, and allows the use of offsets such as soil and biomass sequestration, landfill methane combustion and emission reductions in developing countries.

Stora Enso North America has calculated the division's CO<sub>2</sub> emissions through 2006, and confidently expects to be in compliance, especially when future energy efficiency improvements are factored in.



#### Learning for the future

Since January 2002, Stora Enso has sold green electricity and green certificates from Finland and Sweden through the Nordic Power Exchange Nord Pool to the Netherlands.

Stora Enso's primary aim in this trading has been to gain practical experience related to commercial carbon flows and green energy. This helps the company to prepare for the utilisation of new market mechanisms such as emissions trading, clean development mechanisms and joint imple-

mentation projects. Another benefit is that all the mills involved have gone through very detailed verification processes, allowing them to get an even better insight into their own practices.

The mills involved in the sale of green electricity to the Netherlands are Enocell, Imatra, Kemijärvi, Kotka, Norrsundet, Oulu, Skutskär, Summa, Sunila, Varkaus and Veitsiluoto. Nymölla Mill has additionally sold green electricity generated from bio-fuels to Birka Energy in Stockholm. ■

## Electricity procurement and consumption in the Group in 2002, TWh

	Finland	Sweden	Europe (excl. Finland and Sweden)	North America	Asia	Total
Group resources <sup>1)</sup>						
CHP (Combined heat and power)	4.0	1.0	1.7	0.8	0.03	7.5
Hydropower	0.3	0	0	0.3	0	0.6
Nuclear power	1.3	0	0	0	0	1.3
Other sources	0.5	0	0	0.1	0	0.6
Subtotal	6.1	1.0	1.7	1.2	0.03	10.0
External purchasing	1.9	4.7	3.3	3.4	0.08	13.4
Total procurement	8.0	5.7	5.0	4.6	0.11	23.4
Stora Enso mill consumption	7.7	5.7	4.4	4.6	0.11	22.5
External sales	0.3	0.024	0.7	0	0	1.1

<sup>1)</sup> Group resources = resources owned directly or indirectly by Stora Enso

Much of the electricity purchased externally by the Group is purchased through long-term contracts. This allows Stora Enso to stabilise the effect of potential market fluctuations. Electricity procured from spot markets is also secured against price fluctuations. In line with the Kyoto Protocol, CO<sub>2</sub> emissions related to purchased electricity are not included in the Group's aggregate emission figures. ■