

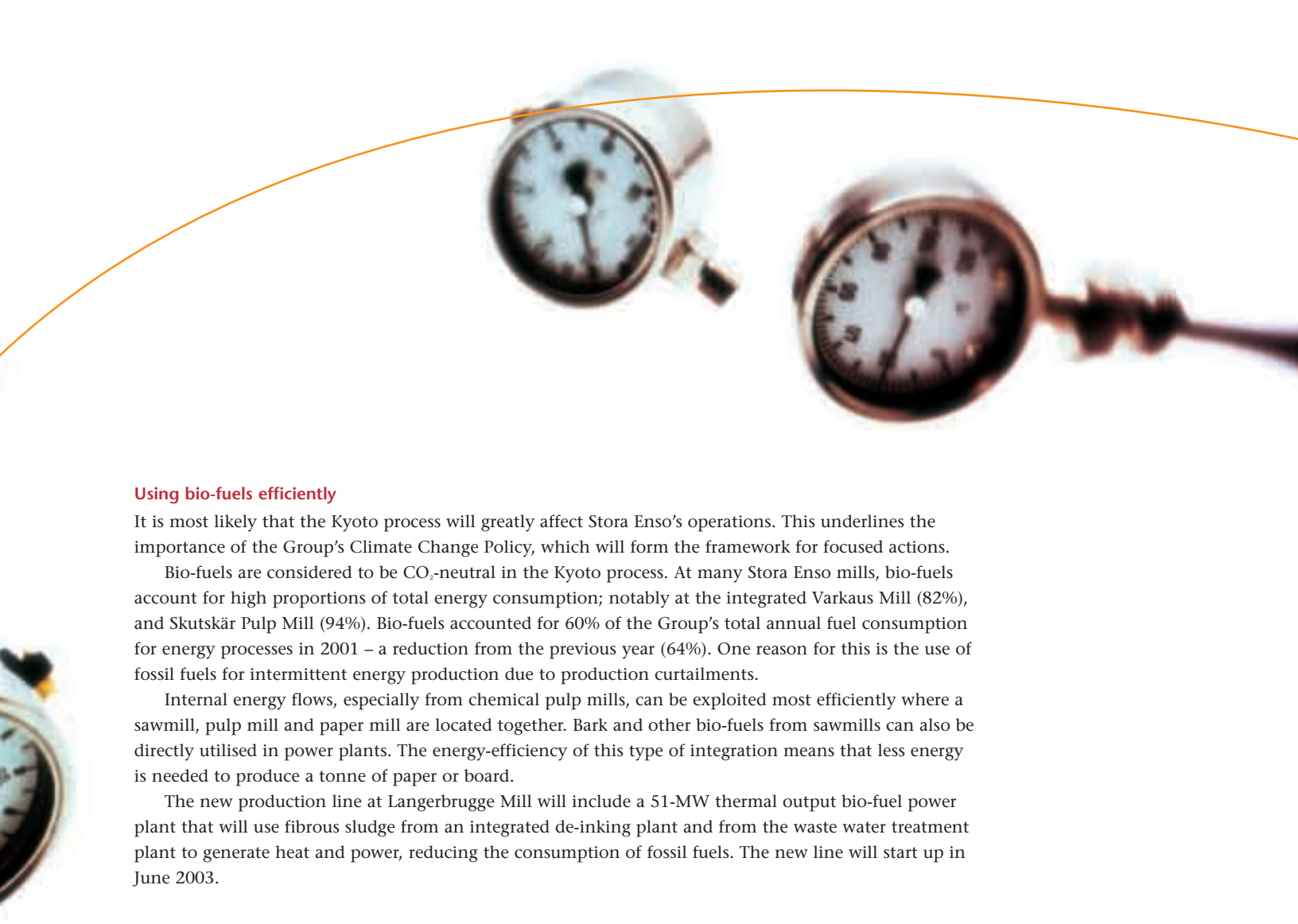
# Energy



## Combating climate change

**Stora Enso is well positioned to make important contributions towards mitigating the effects of climate change. The Group intends to make optimal use of its considerable potential in this work.**

Stora Enso's strengths in abating the effects of the climate change are based on its use of a renewable resource – wood, the high share of bio-fuels in the Group's energy production, a commitment to conserve energy, and the intensive internal use of combined heat and power production (CHP). Furthermore, CO<sub>2</sub>-neutral materials, such as Stora Enso's timber products, can be used as substitutes for products manufactured from non-renewable raw materials. Paper and board products, which can remain in circulation for long periods, also lock in carbon – as do growing forests.



### Using bio-fuels efficiently

It is most likely that the Kyoto process will greatly affect Stora Enso's operations. This underlines the importance of the Group's Climate Change Policy, which will form the framework for focused actions.

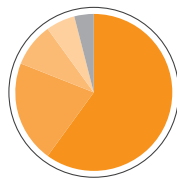
Bio-fuels are considered to be CO<sub>2</sub>-neutral in the Kyoto process. At many Stora Enso mills, bio-fuels account for high proportions of total energy consumption; notably at the integrated Varkaus Mill (82%), and Skutskär Pulp Mill (94%). Bio-fuels accounted for 60% of the Group's total annual fuel consumption for energy processes in 2001 – a reduction from the previous year (64%). One reason for this is the use of fossil fuels for intermittent energy production due to production curtailments.

Internal energy flows, especially from chemical pulp mills, can be exploited most efficiently where a sawmill, pulp mill and paper mill are located together. Bark and other bio-fuels from sawmills can also be directly utilised in power plants. The energy-efficiency of this type of integration means that less energy is needed to produce a tonne of paper or board.

The new production line at Langerbrugge Mill will include a 51-MW thermal output bio-fuel power plant that will use fibrous sludge from an integrated de-inking plant and from the waste water treatment plant to generate heat and power, reducing the consumption of fossil fuels. The new line will start up in June 2003.

### Total consumption of fuel in Stora Enso's production in 2001, TJ

● Bio-fuels	60%
● Gas	21%
● Coal	9%
● Oil	6%
● Peat	4%
Total 206 300 TJ	



Bio-fuels account for some 60% of the Stora Enso Group's total annual fuel consumption of 206 300 TJ, with natural gas amounting to about 21%, and the rest divided between peat, oil and coal.

CHP production covers 52% of the Group's total electricity consumption of 22.5 TWh.

## Electricity procurement and consumption in the Group in 2001, TWh

	Finland	Sweden	Europe (excl. Finland and Sweden)	North America	Asia	Total
Group resources <sup>1)</sup>						
CHP (Combined heat and power)	3.7	1.0	1.6	0.9	0.03	7.2
Hydropower	0.4	0	0	0.2	0	0.6
Nuclear power	1.2	0	0	0	0	1.2
Other sources	0.6	0	0	0	0	0.6
Subtotal	5.9	1.0	1.6	1.2	0.03	9.7
External purchasing	2.0	4.8	3.5	3.5	0.08	13.8
Total procurement	7.9	5.8	5.1	4.6	0.11	23.5
Stora Enso mill consumption	7.5	5.8	4.5	4.6	0.1	22.5
External sales	0.4	0.025	0.6	0	0	1.0

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

### Converting residuals into energy

At Varkaus Mill, the consumption of fossil fuels is being greatly reduced now that the gasification of polyethylene from recovered liquid packaging board has commenced. The new gasification plant will generate 900 TJ energy per year, and allow the recovery of aluminium as well as fibre. Preliminary measurements indicate that atmospheric emissions will be low. This process, developed in Varkaus, is the only one of its kind anywhere in the world. The operation concerned, Ecogas, is owned by Corenso, and was set up in 2001.

### Heat and power – combined strength

Stora Enso already has a good record in combined heat and power generation (CHP), but there is potential for still more schemes. The challenge is to identify the most cost-efficient and eco-efficient projects, and to assess where co-operation with external partners is feasible.

CHP production with an energy-efficiency of 85% reduces emissions, as well as the demand for electricity from the grid. For instance, CHP accounts for 73% of the energy consumed at Norrsundet Pulp Mill, 63% at the integrated Veitsiluoto Mill, and 59% at Sachsen Mill, which produces newspaper. A modern non-integrated chemical pulp mill such as Enocell produces from its own fuels 53% more electricity than it uses in pulp production.

Several Stora Enso mills provide energy for local district heating schemes. The 25 000 residents of the town of Varkaus are kept warm throughout the year mainly thanks to secondary heat from Stora Enso's Varkaus Mill. The towns and villages of Heinola, Kotka, Nymölla and Skutskär are also heated through similar schemes.

### Audits show improvements in energy conservation

Stora Enso will further strengthen energy-efficiency auditing procedures throughout the Group. All the European mills have gone through at least one auditing round. Auditing has also begun in the United States, and the first round will be completed in 2002.

By the end of 2001, a total of 117 mills and machines had been audited. The results of these audits have indicated where energy-saving potential still exists, and confirmed the importance of training, systematic reporting, and the sharing of best practices. Many important technical developments were reviewed in 2001.

At Reisholz Mill, a shoe press was installed in Paper Machine 2, leading to a 30% decrease in steam consumption (from 3.5 GJ/tonne to 2.3 GJ/tonne in 2001); since with less moisture remaining in the paper after the pressing phase, less energy is needed in the drying phase.

At Veitsiluoto Mill, process water is now heated with secondary heat from the bleaching plant. This improvement has led to annual energy savings of 350 TJ.

At Hylte Mill, annual NO<sub>x</sub> emissions were reduced by more than 11 tonnes, through improvements in the oil and natural gas burners of Boiler 2 that eliminate excess air.



### Policy

Stora Enso intends to exploit the Group's considerable potential to mitigate climate change through joint efforts with other businesses and sectors.