

# Favourable developments in 2004

Most environmental performance indicators developed favourably during 2004. Significant reductions were achieved for all discharges into water, with reductions ranging from almost 7% for nitrogen, and 7–8% for AOX and COD, to more than 16% for phosphorus, normalised for production volume. Emissions to air were reduced by more than 6% for CO<sub>2</sub> from non-renewable sources, and by 4% for both SO<sub>2</sub> and NO<sub>x</sub>. Landfilling of waste, however, increased by 9%, normalised for production.

One significant reason for the improvements in discharges to water is the fact that during 2004 Stora Enso's production facilities were more fully utilised than over the last couple of years. There have been fewer production cur-

tailments, and operating conditions have consequently been more stable. Specific measures successfully implemented during the year have also helped to curb emissions. Examples include the shut-down of the high-yield sulphite and groundwood pulp plants at **Port Hawkesbury**, and corrections made to solve operational problems at the **Imatra** and **Kemijärvi mills**.

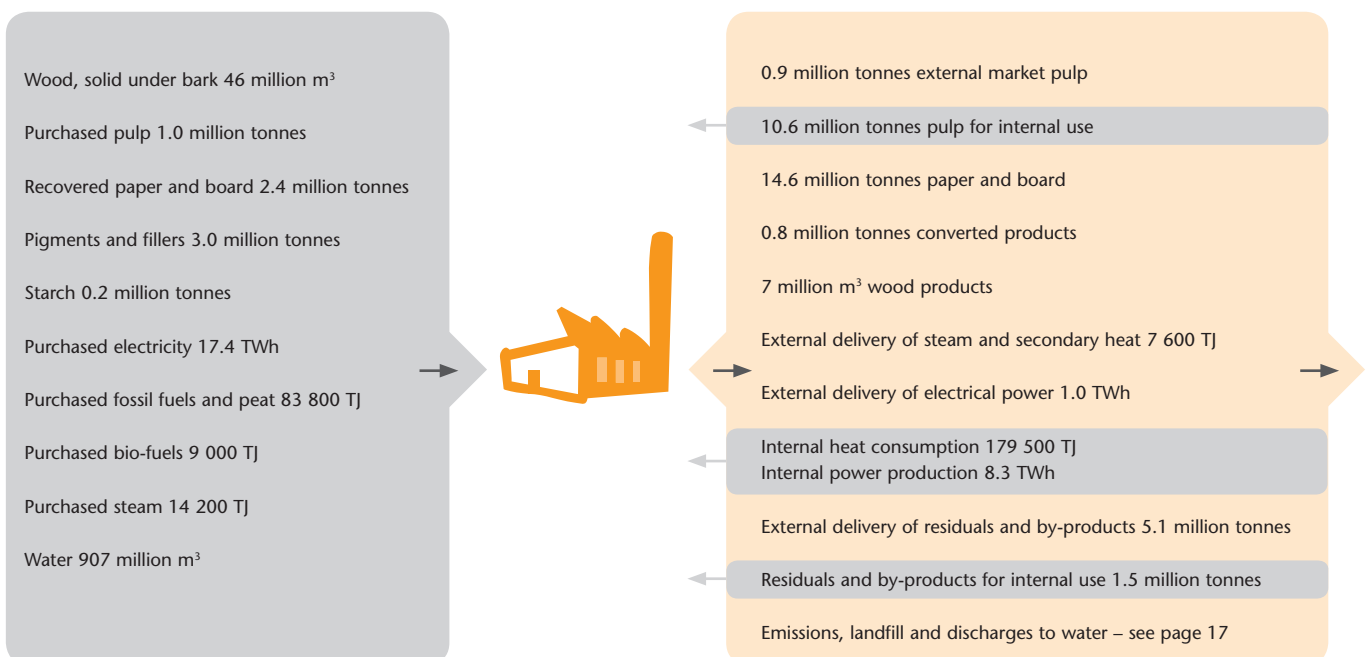
Emissions to air of CO<sub>2</sub> from non-renewable sources and of SO<sub>2</sub> are both mainly influenced by the selection of fuels in use. The share of bio-fuels in Stora Enso's energy mix increased during 2004, which has helped to reduce emissions of CO<sub>2</sub> and SO<sub>2</sub> per tonne of product.

The increased landfilling of waste during 2004 was mainly due to specific

circumstances at three sites. Less waste from **Duluth Mill** can now be beneficially used to cover landfills, due to new limitations set by the State of Minnesota. At **Maxau Mill**, waste generated during the rebuilding of paper machine no. 6 has caused a temporary increase in landfilling. Reduced demand for construction material for the landfill site at the **Water Quality Center** in Wisconsin Rapids has meant that less waste from **Biron Mill** could be used for this purpose.

Due to improvements in data management, some figures do not correspond exactly to those reported on pages 17 and 46–49 of the Sustainability Report 2003. •

## Material flows



## Emissions, discharges and landfill

DISCHARGES INTO WATER, tonnes	2002	2003	2004
COD	152 500	170 200	165 700
AOX	590	680	660
Phosphorus	330	340	300
Nitrogen	1 710	1 830	1 800
EMISSIONS TO AIR, tonnes			
CO <sub>2</sub> , non-renewable fuels	5 726 000	6 031 000	6 001 000
CO <sub>2</sub> , renewable fuels	16 229 000	16 468 000	17 209 000
CO <sub>2</sub> , total	21 955 000	22 499 000	23 210 000
SO <sub>2</sub>	19 200	19 700	20 000
NO <sub>x</sub> (NO <sub>2</sub> )	19 200	20 100	20 400
WASTES, tonnes			
Wastes to landfill	291 300	334 700	386 400
Hazardous waste	4 130	4 100	11 600

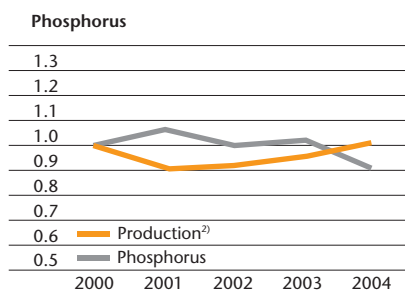
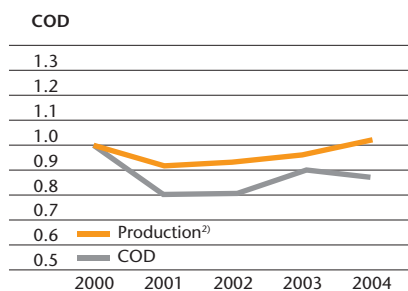
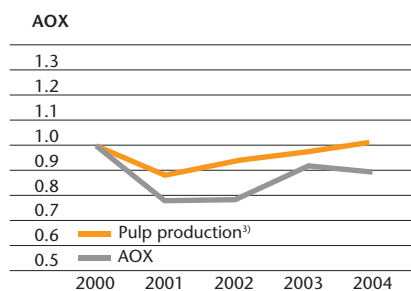
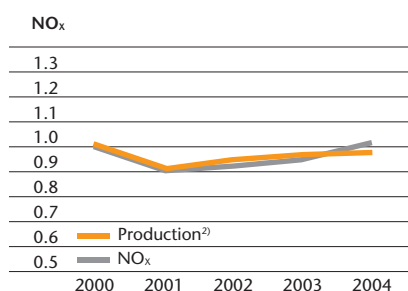
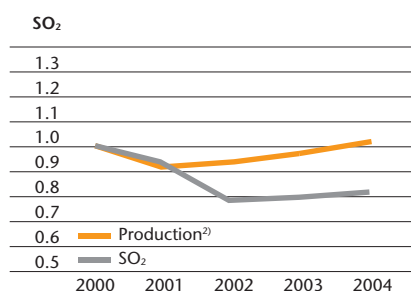
## CO<sub>2</sub> emission factors

The following factors have been used in 2004 when calculating CO <sub>2</sub> emissions:	
Emission factors (WRI/WBCSD <sup>1)</sup> ) kg CO <sub>2</sub> /GJ	
Black liquor	126
Bark 50% (dry state)	125
Residuals, bio-fuel	125
Wood waste	125
Sludge	110
Peat	106
Soap, tall oil	100
Coal	95
Heavy oil	77
Light oil	74
Residuals, fossil	74
Pitch oil	70
Methane, methanol, turpentine	63
Natural gas	56
Hydrogen	0

<sup>1)</sup> Based on pulp and paper calculation tools issued under WRI/WBCSD greenhouse gas protocol.

## Emissions, waste and production<sup>1)</sup>

Index 2000 = 1,0



<sup>1)</sup> Emissions from sawmills are excluded.

<sup>2)</sup> Sales production of market pulp, paper and board

<sup>3)</sup> Bleached chemical pulp

<sup>4)</sup> 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.

