Trends in World Bleached Chemical Pulp Production: 1990-2001

May 2002

SUMMARY

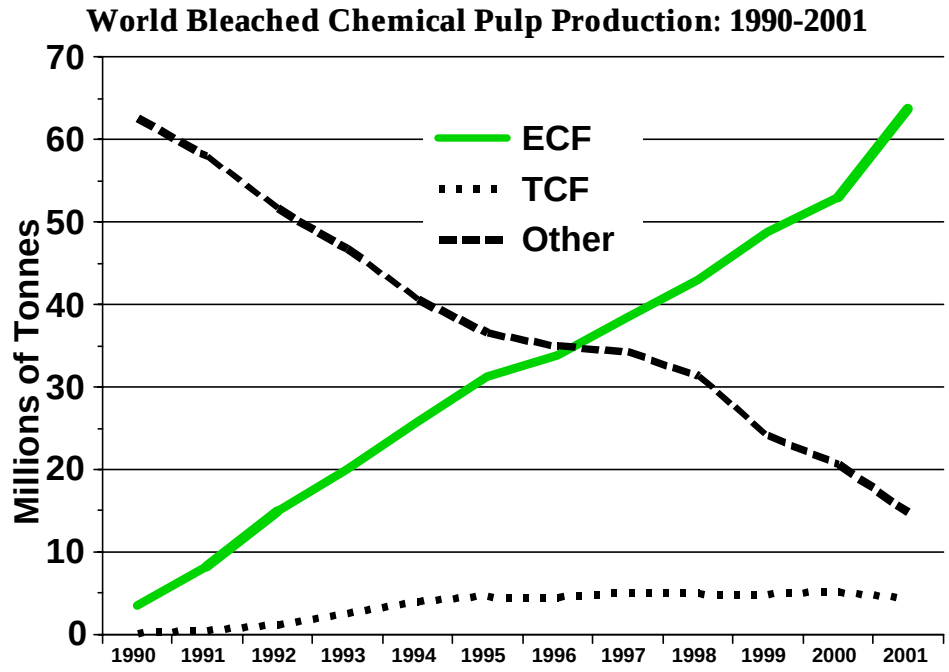
Elemental Chlorine-Free (ECF) pulp, bleached with chlorine dioxide, continues to grow and now dominates the world bleached chemical pulp market. In 2001, ECF production reached over 63 million tonnes, totaling more than three-quarters of the world market share.

Market data show ECF grew at an annual rate of 17% in 2001. In contrast, TCF (Totally Chlorine-Free) production declined slightly, maintaining a small niche market at just over 5% of world bleached chemical pulp production.

Government organizations increasingly recognize and document ECF's proven pollution prevention record and acknowledge ECF as a component of Best Available Technology (BAT). Producers and users alike continue to desire ECF's superior product quality. It is no wonder that with such continuing strong government support and overall environmental integrity, new bleached chemical production coming on to the market will use ECF-based bleaching technology.

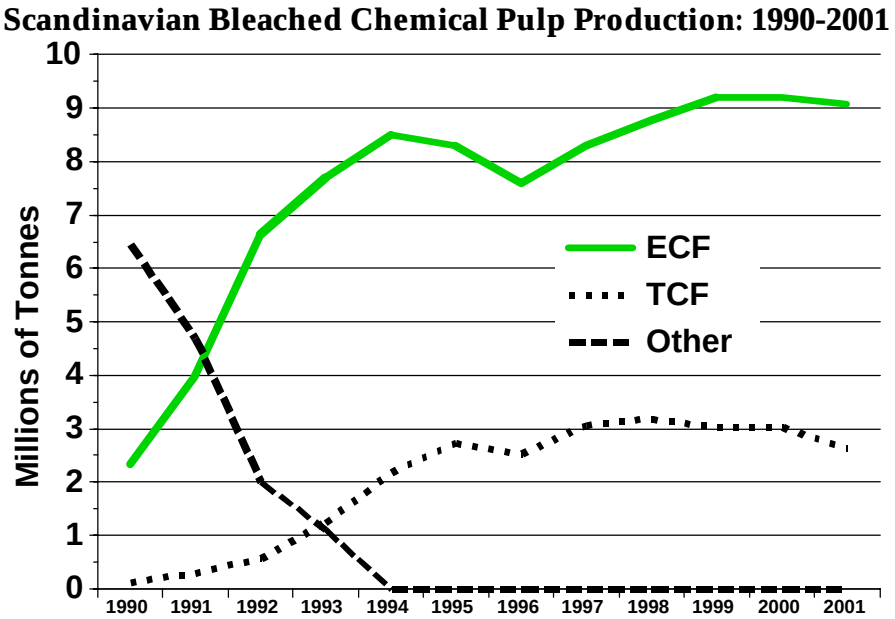
WORLD BLEACHED CHEMICAL PULP PRODUCTION PROFILE

In 2001, ECF commanded the highest worldwide market share at greater than 75%, totaling more than 63 million tonnes. ECF market share continues to grow in all pulp producing regions. This trend will continue as new production planned in South America and Germany will incorporate ECF bleaching [1-3].



Scandinavia

In Scandinavia, ECF continues to dominate and is increasingly recognized for its advantages [4]. In 2001, ECF accounted for over 75% of bleached chemical pulp production --- more than triple that of TCF. Significantly, new fibrelines in Scandinavia are ECF-based [5].

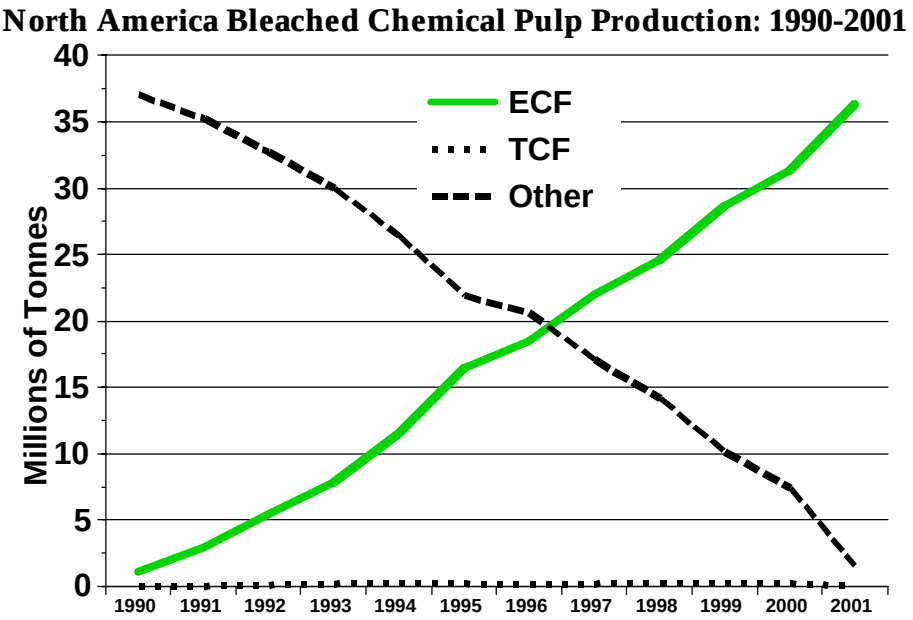


Japan

Japan produces approximately 8 million tonnes of bleached chemical pulp. Consistent with the commitment made by the major bleached pulp producers in Japan to eliminate chlorine and in most cases, convert to ECF, Japanese ECF production continues to grow at a rapid pace [6,7]. In 2001, an additional 800,000 tonnes of pulp was converted to ECF, and now represents almost one-quarter of all bleached chemical pulp production in Japan.

North America

In North America, ECF production grew by more than 15% to represent over 95% of bleached chemical pulp production. Separately, in 2001 Canadian production of ECF remained steady, holding more than 93% of the market. In the United States, ECF grew substantially, with another 5 million tonnes entering the market in 2001 as many mills came into compliance with the US Environmental Protection Agency's Cluster Rule. The Cluster Rule is based in part on ECF as Best Available Technology (BAT) for bleached paper grade kraft and soda mills [8]. The transition to ECF is essentially complete in the United States as ECF production now represents 96% of bleached chemical pulp production.



LOOKING AHEAD

Significantly, ECF was recently recognized as a component of "Best Available Techniques" (BAT) by the European Community in its Integrated Pollution Prevention and Control (IPPC) reference document [9].

In addition, a recent Scientific Advisory Panel, appointed by the Province of British Columbia in Canada, reiterated the environmental compatibility of ECF-based bleaching with the ambient aquatic receiving environment [10].

Finally with its recognition as a component of BAT by the European Commission, its acknowledged environmental compatibility, its cost-competitiveness, and high quality desired by producers and users alike, growth for ECF is ensured.

SOURCES

The Alliance for Environmental Technology, "Trends in World Bleached Chemical Pulp Production: 1990-2000," October 1999.

2001 AET International Survey

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APPENDIX (ALL DATA IN MILLIONS OF TONNES*)

WORLD

	ECF	TCF	OTHER
1990	3.5	0.1	62.7
1991	8.2	0.4	58.2
1992	14.9	1.2	51.8
1993	20.0	2.6	46.8
1994	25.7	4.1	40.8
1995	31.2	4.7	36.8
1996	34.0	4.5	35.0
1997	38.4	5.0	34.4
1998	43.1	5.1	31.4
1999	48.8	5.0	24.1
2000	54.4	5.2	20.8
2001	63.7	4.5	14.9

SCANDINAVIA

	ECF	TCF	OTHER
1990	2.3	0.1	6.5
1991	4.0	0.3	4.7
1992	6.6	0.6	2.0
1993	7.7	1.3	1.1
1994	8.5	2.2	0.0
1995	8.3	2.8	0.0
1996	7.6	2.6	0.0
1997	8.3	3.1	0.0
1998	8.8	3.2	0.0
1999	9.2	3.0	0.0
2000	9.2	3.0	0.0
2001	9.1	2.6	0.0

UNITED STATES

	ECF	TCF	OTHER
1990	0.5	0.0	26.8
1991	1.6	0.0	25.6
1992	2.8	0.0	24.4
1993	4.0	0.2	23.0
1994	6.0	0.2	21.0
1995	9.1	0.3	17.9
1996	10.4	0.2	16.6
1997	13.3	0.2	13.8
1998	15.5	0.2	11.4
1999	18.1	0.2	8.9
2000	20.7	0.2	6.3
2001	25.9	0.1	0.9

CANADA

	ECF	TCF	OTHER
1990	0.7	0.0	10.3
1991	1.3	0.0	9.7
1992	2.6	0.0	8.4
1993	3.9	0.1	7.0
1994	5.5	0.1	5.5
1995	7.3	0.0	4.2
1996	8.1	0.0	4.0
1997	8.7	0.0	3.4
1998	9.1	0.0	2.8
1999	10.5	0.0	1.3
2000	10.7	0.0	1.1
2001	10.5	0.0	0.7

REST OF WORLD (Includes Eastern and Western Europe, Chile, Brazil, South East Asia, Africa, Australia, New Zealand, and Japan)

	ECF	TCF	OTHER
1990	0.1	0.0	19.1
1991	1.3	0.1	18.2
1992	2.9	0.6	17.0
1993	4.4	1.1	15.7
1994	5.8	1.6	14.3
1995	6.5	1.6	14.7
1996	7.9	1.8	14.4
1997	8.2	1.8	17.2
1998	9.7	1.7	17.2
1999	11.0	1.7	14.0
2000	13.9	2.0	13.3
2001	18.3	1.7	13.4

*All data has been rounded to the nearest tenth