

11. SUMMARY OF THE PRESENT NATRON AND THE PROPOSED DEVELOPMENT PROGRAM

11.1 OUTLINE OF THE PRESENT NATRON

11.1.1 Name of Company: "NATRON" Maglaj d.d.

11.1.2 Address: Bosnia and Herzegovina, Maglaj City

11.1.3 Establishment: 1968

11.1.4 Business: Production of Pulp, Kraft Paper and Paper Packing

11.1.5 Number of Employees: 1,638 (February 1998; 4,491 at end of 1991)

11.1.6 Capital: DM160,371 thousand (Shareholders: Government 37.7%, Employees of Natron 62.3% at the end of 1997. Share of Government is planned at 70%)

11.1.7 Production (in ton)

Products	1991	1997	1997/1991
Pulp	120,000	-	-
Paper	150,000	4,674	3.1%
(Corrugated board)	(32,000)	(2,274)	(7.1%)
(Sacks and bags)	(35,000)	(2,400)	(6.9%)
(Sack paper)	(83,000)	(0)	(0%)

11.1.8 Sales (in DM1,000)

Products (Domestic)	1991		1997		97/91
	Quantity	Amount	Quantity	Amount	
Natron paper (ton)	31,145	82,358	317	336	0.4%
Tape, sheet (ton)	3,541	14,659	150	2,718	18.5%
Natron sack (thou. Pieces)	142,780	148,707	9,193	4,419	3.0%
Paper bag (thou. Pieces)	18,324	5,584	2,326	417	7.5%
Corrugated board, and wrapping (ton)	30,079	114,975	2,605	4,504	3.9%
Sub total	-	366,283	-	12,394	3.4%
(Export)	Quantity	Amount	Quantity	Amount	
Paper (ton)	14,699	12,281	2,292	1,703	13.9%
Sack, box etc.	-	5,517	-	194	3.5%
Sub total	-	17,798	-	1,897	10.7%
Grand total	-	384,081	-	14,291	3.7%

Note: Sales for former Yugoslavia is included in (Domestic) in 1991, (Export) in 1997.

11.1.9 Machines in operation at the end of 1997 and their capacities

(1) Pulpers

Pulper	Capacity	Material	Attachment
Pulper using Waste Paper	150 ton/day	Waste Paper	Coarse Screen
Pulper using Purchased Pulp	150 ton/day	Purchased Pulp	Conveyer
Pulper using Broke	100 ton/day	Broke	Conveyer

(2) Paper Machines (PM)

PM	Capacity	Products	Specification	Material
PM-1 (65% of total yield in 1991)	50,000 ~60,000 ton/annual	Testliner	140~200g/m ²	Waste Paper Pulp
		Top Testliner	50g/m ²	Purchased Pulp
		Fluting	112~150g/m ²	Waste Paper Pulp
		Schrenz	127g/m ²	Waste Paper Pulp
		OPN Sack Paper	80~100g/m ²	Purchased Pulp 50%, Waste Paper Pulp 50%

(3) Corrugated Board Production Machines

Machines	No.	Width	Speed	Capacity	Raw Paper	Energy
Corrugator	1	1,600m m	100m/min	119,750 thousand m ² /a	71,850 t/a	depends on Paper Machines' operation (when PM stops, corrugators must stop)
Corrugator (will be completed in June '98)	1	2,100m m	300m/min			
Glue (set)	1	Warm Glue Method				

(4) Corrugated Box Production Machines

Machine	No	Width	Speed	Colors	Property	Capacity	Raw Paper
Printer, Plotter	1	3,600mm	90 r.p.m	2	Oily	11,405	6,843 t/a
	1	2,700mm	120 r.p.m	2	Water	12,773	7,664 t/a
Gluer	1	2,200mm	150 r.p.m	2	Water	19,958	11,975 t/a
Total						44,136	26,482 t/a

Note: Capacity is in thousand m²/a

(5) Sacks Production Machines

Machines		Speed	Capacity	Raw Paper	Material
Large sized Sacks	Overlay 5	100r.p.m	133,056 thousand pieces/a	36,590t/a	Kraft paper (import from Hungary)
	Bottomlay 7				
	Bottom Sew 6				
Small sized	3	70r.p.m	55,883thou p/a	1,956t/a	

11.1.10 Capacity of Paper Machines

PM	Products	Capacity	Present Operation
PM1	Corrugated board, OPN Sack paper	50~60 thou. ton/a	10days per 2 months
PM3	MG Paper	10 thousand ton/a	Halt
PM4	Kraft Paper(NATRON Paper) etc.	60 thousand ton/a	Halt

11.1.11 Financial Statements (1997, in DM1,000)

Balance Sheet

Assets		Debts & Owners' equity	
Current Assets	16,097	Current Debts	3,312
A/C Receivable	5,391	A/C Payable	2,376
Raw Materials	4,509	Others	936
Products	5,304	Long-term Debts	46,115
Others	893	Long-term Loan	41,132
Fixed Assets	195,314	Others	4,983
Fixed Assets	193,145	Owners' Equity	161,984
Land	30,584	Capital	160,371
Buildings	133,203	Retained Earnings	1,613
Machinery	29,358		
Intangible Assets	2,169		
Total	211,411	Total	211,411

Income Statement

Sales	17,164
Cost of Sales	31,781
(Depreciation)	(5,871)
Ordinary Income	-14,617
Other Income	1,400
Net Income	-13,217

11.2 SUMMARY OF THE PROPOSED DEVELOPMENT PROGRAM

11.2.1 Market

Products	Market
Sack paper	Clupak sack Kraft paper produced on PM4 is quality-wise competitive in export market. Italy, Middle East & North Africa might be the most promising markets.
MG (Machine Glazed) paper for bag	Can compete in quality & costs. Export mainly to Slovenia & Italy.
SC(Semi-chemical) Fluting	Can compete in quality & costs. Best quality for corrugating medium. Market should be in Italy & South Europe etc.
Corrugated board	Typical home-market product. The political, economical recovery in ex-Yugoslavia region is an essential condition. Natron's high-quality SC fluting could improve cost-competitiveness of corrugated board.

Possibility to use transport systems (rail, harbor) is a prerequisite for this development program.

11.2.2 Production Principles

To get the highest benefit of existing facilities without excessive investments, the following 4 production principles are targeted;

- (1) Simple, streamlined production lines
- (2) Full capacity utilization
- (3) Minimum grade changes
- (4) Stable exportable quality

11.2.3 Production Policy

(1) Two Pulping Lines to be Started Simultaneously

Both pulping processes can be combined to common chemical recovery with only minor process modifications. Green liquor from the Kraft pulping is used as cooking liquor in hardwood pulping (cross-recovery).

(2) Advantage of SC Fluting

SC fluting has superior quality competitiveness in export markets, compared with waste paper based fluting.

(3) Attribute of Paper Machines (PM), and Advantage of Single Production

- 1) PM1 is suitable for fluting, corresponding to the output of SC hardwood pulp from the Kamyr pulping line.
- 2) PM3 can be used in production of special MG paper.
- 3) PM4 is suitable for sack paper production, using unbleached softwood Kraft pulp,

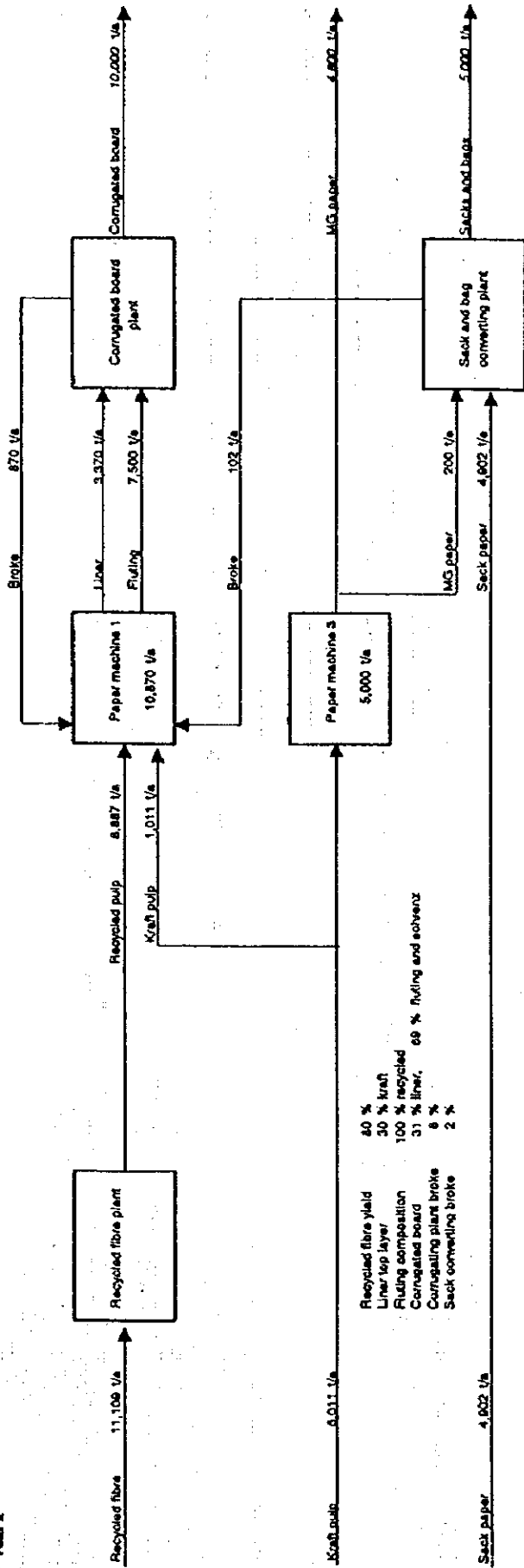
because it is equipped with high consistency refining and Clupak unit.

- 4) These paper machines produce only one paper grade at full capacity, resulting in maximizing the efficiency and minimizing the costs.
- (4) Converting plant to be developed so that product mix meets market requirements.
- (5) Start-up of PM2 to produce schrenz from waste paper was considered, but the plan has not been found feasible for the following reasons:
 - 1) Products produced by PM2 are low in quality, and make a deficit in gross margin level, so causing a decline in the IRR of Natron.
 - 2) Width of paper products produced by PM2 mismatches new corrugated machine installed in June 1998. On the other hand, PM1 matches the new machine.
 - 3) Much investment is required for restarting PM2. Such investment can be in vain due to future suspension.
 - 4) Pulp plant with recovery boiler and Kamyr digester is utilized for PM1, 3 and 4. PM2 does not contribute to pulp plant operation.
- (6) No waste paper will be used after mid-2000 (Long-term program). Because:
 - 1) Efficient collection of domestic waste paper in the future is not necessarily possible.
 - 2) After starting the pulp plant, recovery boiler and Kamyr digester need to be utilized to over 50% of capacity. After extension of the dryer section, capacity of PM1 will correspond with the minimum capacity of the recovery boiler and Kamyr digester. If waste paper is used on PM1, the 50% capacity usage of the recovery boiler and Kamyr digester will not be achieved..

11.2.4 Development Program

Phase	Immediate Program (July-Dec.1998)	Short-term Program (Jan.1999-June2000)	Long-term Program (July2000-Dec.2009)
Target	<ol style="list-style-type: none"> 1. Improve product quality & marketing. 2. Reduce production cost. 3. Rehabilitation & start-up of effluent treatment & ash dumping system before start-up of PM3 	<ol style="list-style-type: none"> 1. Increase production of PM1 & converting plant. 2. PM3 starts producing MG paper using market Kraft pulp. 3. Prepare long-term program. 	<ol style="list-style-type: none"> 1. Normal, continuous production with full capacity 2. Both pulping lines start at the same time.
Pulping Line (Batch)	-	-	Operates with maximum production of 66,000 ADt/a. Supply softwood Kraft pulp to PM3 & PM4
Pulping Line (Kamyr Continuous)	-	-	Has to be operated with minimum production of 60,000 ADt/a. Supply hardwood SC pulp to PM1.
Waste Paper Plant	Supply waste paper pulp to PM1	Supply waste paper pulp to PM1	Ceases operations but to be preserved for the future possible restart.
PM1	Fluting, Schrenz, Testliner, NATRON paper	Do. Production is increased.	Produces Fluting 73,000 t/a by hardwood SC pulp. The fluting property meets demands from export markets.
PM3	-	MG paper for paper bag mainly for export market	MG paper 9,000 t/a. Pulp supply changes from Market pulp to NATRON Kraft pulp, and costs are reduced.
PM4	-	-	Sack paper 57,000 t/a by NATRON Kraft pulp.
Converting Plant	Corrugated board & box, Sacks, Bags	Do. Production is increased.	Do. Testliner is to be purchased.
Remarks	<ol style="list-style-type: none"> 1. Paper qualities are acceptable for domestic customers. 2. Production is intermittent because of limitations in raw material & market. 	<ol style="list-style-type: none"> 1. Production is still intermittent. 2. Comprehensive training program for all employees to raise technical knowledge has to be realized. 	<ol style="list-style-type: none"> 1. Concentration on only one grade improves the paper properties & paper machine efficiency. 2. Operation with full capacity reduces costs, and increases competitiveness. 3. PM4 needs thorough repair before restart.

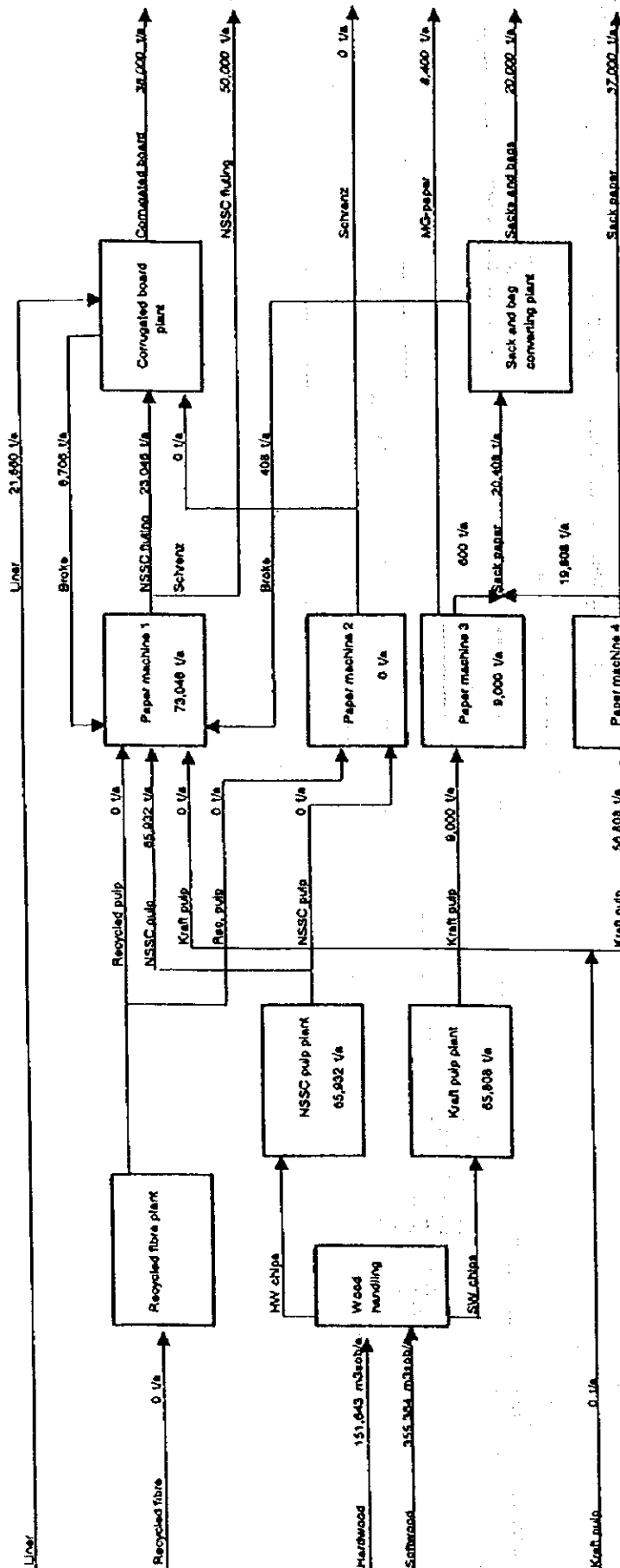
Fibre balance, Short Term Programme
 Purchased kraft pulp, own MG paper production
 Year 2



Recycled fibre yield	40 %
Liner top layer	50 % kraft
Fluting composition	100 % recycled
Corrugated board	31 % liner, 69 % fluting and solvent
Corrugating plant broke	8 %
Sack converting broke	2 %

Appendix 7-1

Fibre balance, Long Term Programme, excl. PM2
Own kraft pulp and NSSC pulp production
Year 8 and onwards



Recycled fibre yield 80 %
 NSSC pulp wood consumption 2.3 m³/tonne
 Kraft pulp wood consumption 5.4 m³/tonne
 Fluting composition PM1 100 % NSSC 0 % recycled
 Schrenz composition PM2 0 % NSSC 100 % recycled
 Corrugated board 57 % linear 43 % fluting
 Converting plant broke 15 %
 Sack converting broke 2 %

11.2.5 Start-up Costs for Development Program

Phase	Technical Target	Start-up and Investment Costs	Market	Raw Material
Immediate Program (July-Dec.1998)	<ol style="list-style-type: none"> 1. Grade-up quality, marketing, and reduce costs. 2. Improve current PM1 production (10 days per 2 months) for corrugated board & box, sacks & bags. 3. PM1 for Fluting, Schrenz, Testliner & NATRON paper by using waste paper & market pulp. 4. Immediate environment protection : Waste water, Shift coal ashes from into river to dump. 5. Compact oil boiler to improve energy efficiency and increase corrugated board & box plant. 6. Prepare to start Short-term program. 	DM3 million	<ol style="list-style-type: none"> 1. Domestic market mainly. 2. Annual GDP growth rate is expected 21% from 1996 to 2000. 	<ol style="list-style-type: none"> 1. Domestic waste paper. 2. Sack paper imported from Hungary. 3. Market pulp imported from Russia, Swaziland, Sweden.
Short-term Program (Jan.1999-June2000)	<ol style="list-style-type: none"> 1. Improve paper properties of PM1. 2. Start PM3 for MG paper of 5,000 1/a for Paper bags & Carrier bags by using market pulp. 3. Prepare to start Long-term program. 	DM41 million	(MG paper) Domestic1,000, Slovenia & Italy3,000, Others 1,000, Total 5,000 tons/year.	Market pulp imported from Russia, Swaziland, Sweden.
Long-term Program (July2000-Dec. 2009)	<ol style="list-style-type: none"> 1. Start full production of softwood Kraft pulp & hardwood SC pulp. Wood handling equipment to debark and make chip. 2. PM3 for MG paper by using NATRON's kraft pulp. 3. Start PM4 for sack paper using NATRON's kraft pulp. 20 thousand tons for NATRON's own sack plant, 37 thousand tons for export. 4. PM1 for Fluting by using NATRON's SC pulp. 5. Waste water treatment for European standard. 	DM95 million DM55 million DM84 DM139 million	Domestic market & Export (ex Yugoslavian countries, Southern & Central Europe, Middle East, Southeast Asia, North Africa etc.) Total 153,000 tons/year.	<ol style="list-style-type: none"> 1. Domestic pulp wood: Softwood for Kraft pulp & Hardwood for SC pulp. 2. 22 thousand tons of Testliner is to be purchased.
	<p>Start-up costs</p> <p>Investment costs</p> <p>Grand Total</p>			

11.2.6 Alternative Plan (Survival Plan)

Plant & Machinery	Pulp Plant	PM 1	PM 3	PM 4	Converting Plant
Basic Plan	○	○	○	○	○
Alternative Plan	×	○	○	×	○

- (1) If no investor shows up, the immediate program should be continued as a survival plan.
- (2) Pulp mills will not operate. All paper material should be purchased from outside.
- (3) Sales and profit will be smaller.
- (4) Only small number of employees are needed.

(5) Development Program for Alternative Plan (Survival Plan)

Phase	Immediate Program (July~Dec.1998)	Survival Program (Jan.1999~)
Target	<ol style="list-style-type: none"> 1. Improve product quality & marketing. 2. Reduce production cost. 3. Rehabilitation & start-up of effluent treatment & ash dumping system before start-up of PM3 	<ol style="list-style-type: none"> 1. Increase production of PM1 & converting plant. 2. PM3 starts producing MG paper using market kraft pulp. 3. Prepare long-term program.
Waste Paper Plant	Supply waste paper pulp to PM1	Supply waste paper pulp to PM1
PM1	Fluting, Schrenz, Testliner, NATRON paper	Do. Production is increased.
PM3	-	MG paper for paper bag mainly for export market
Converting Plant	Corrugated board & box, Sacks, Bags	Do. Production is increased.
Remarks	<ol style="list-style-type: none"> 1. Paper qualities are acceptable for domestic customers. 2. Production is intermittent because of limitations in raw material & market. 	<ol style="list-style-type: none"> 1. Production is still intermittent. 2. Comprehensive training program for all employees to raise technical knowledge has to be realized.

(6) Start-up Costs for Alternative Plan (Survival Plan)

Phase	Technical Target	Start-up Costs	Market	Raw Material
Immediate Program (July-Dec.1998)	<ol style="list-style-type: none"> 1. Grade-up quality, marketing, & reduce costs. 2. Improve current PM1 production (10 days per 2 months) for corrugated boxboard, sacks & bags. 3. PM1 for Fluting, Schrenz, Testliner & NATRON paper by using waste paper & market pulp. 4. Immediate environment protection : Waste water, Shift coal ashes from into river to dump. 5. Compact oil boiler to improve energy efficiency 6. Prepare to start Short-term program. 		<ol style="list-style-type: none"> 1. Domestic market mainly. 2. GDP growth rate is expected 21% from 1996 to 2000. 	<ol style="list-style-type: none"> 1. Domestic & imported waste paper. 2. Sack paper imported from Hungary. 3. Market pulp imported from Russia, Swaziland, Sweden.
Survival Program (Jan.1999~)	<ol style="list-style-type: none"> 1. Improve PM1 2. Electrical maintenance, Fiber & Heat recovery 3. Start PM3 for MG paper of 5,000 t/a for Paper bags & Carrier bags by using market pulp. 4. Improve Converting Plant: (1) Corrugated board & box Maintenance, Die cutter line (2) Sacks: Maintenance, Automation 	DM3.2 million	(MG paper) Domestic 1,000 Slovenia & Italy 3,000 Others 1,000 5,000 tons	Market pulp imported from Russia, Swaziland, Sweden.
		DM9.8 million		
	Grand total for start up costs (4.8million DM for Die cutter should be invested after the first 3 years)	DM13 million		

11.2.7 Financial Feasibility of the Program

(1) Internal Rate of Return (IRR)

Types of IRR	Basic Plan		Survival Plan	
	IRR	Cost of Capital	IRR	Cost of Capital
IRROI before tax	27.1%	13.9%	36.8%	14.5%
IRROI after tax	22.9%	13.8%	33.6%	14.5%
IRROE after tax	39.8%	15%	44.3%	15%

IRROI before tax of 27.1% greatly exceeds the cost of capital (WACC) of 13.9%.

IRROI after tax of 22.9% is closer to the WACC after tax of 13.8%, but it still is significantly over 13.8%. It also shows the importance of government's supporting policy for taxation.

IRROE after tax of 39.8% also exceeds much the investors' expected return of 15%.

Therefore, the program can be appraised as satisfactorily feasible.

IRR of the survival plan is higher than the basic plan, but it achieves only a reduced equilibrium. Therefore it has less social significance.

(2) Reasons for the Program's Good Results

- 1) Small investment required
- 2) Export-oriented marketing policy
- 3) Productivity improvement
- 4) Plentiful labor force

(3) Essential Points to the Program

1) Financing first three years (1998 ~ 2000)

In order to compensate shortage of funds for first three years of DM59.1 million, and to cover total investments of DM139.1 million etc., the program needs to raise DM83 million (long-term loan DM68 million and equity DM15 million), of which DM72 million (87%) should be raised in the first three years.

2) Tie-up with strategic investors (international pulp and paper companies)

12. RECOMMENDATION

12.1 SELF-HELP BY NATRON

To cope with the post-war difficult situation, Natron has taken some measures below:

- (1) Reduction of Number of Employees and Payroll Cost
- (2) Sales of Surplus Assets
- (3) Related Businesses
- (4) Reduction of Administrative Costs and Adopting Conservative Accounting Methods
- (5) Recommendation for Further Self-help

At first Natron should improve products' quality and promote sales marketing by raising employees' morale.

12.2 RECOMMENDATIONS TO THE BOSNIAN GOVERNMENT

Bosnian business should transit to market economy as soon as possible. So Bosnian government should protect and support Bosnian industries with a postwar special reconstruction policy-mix.

It is recommended that key industries in Bosnia such as pulp and paper company should be given priority for government aid.

(1) Promoting Inter-state owned enterprises (SOE) Transactions

Bosnian government should instruct cement, sugar, flour companies and post offices to purchase Natron's sack paper and corrugated board, and similarly instruct Natron to purchase those companies' goods in exchange.

(2) Reconstruction of Domestic Banking System

The government should assist the recovery in the domestic banking system. For instance, by means of establishing public financial institution for key industries, promoting postal savings, and borrowing hard currency from foreign banks under government guaranty.

Concerning the public financial institution, a postwar 'Reconstruction Medium/Long-term Fund' is recommended. The fund should be independent from Bosnian government, and funded by European countries and EBRD etc. The fund can be managed by well-informed loan appraisers from advanced countries. Its existing period should be limited to about 10 years.

(3) Aid to Get Rid of Barter Transactions

Paying fines for insolvency is a severe burden on companies and it increases barter transactions. The repeal of such fines should be considered to recover sound cash settlement transactions among companies in order to gain business credit from superior foreign bankers.

The establishment of a 'Short-term Money Settlement Institution' contributed by Bosnian central bank and donor countries should be considered.. The member of the institution is limited to Bosnian priority companies including Natron, and trustworthy foreign banks and companies. The institution has computerized central settlement system, and funds for short-term loans and relief. Members' transactions are registered to the institution, and those are settled among members' accounts by netting balance clearing method. This system can reduce cash volume for settlement, credit risk, and troublesome barter transactions. As a result it will accelerate revival of key industries and Bosnian financial system.

(4) Exemption of Taxes or Deferment of Taxation

(5) Transfer of Natron's Long-term Debt to Government

(6) Reduction of Additional Burden on Payroll

(7) Increasing Natron's Portion of Surplus Assets Sales

(8) Transfer of Surplus Employees to the Government

SOEs keep many surplus employees. Central and local governments should transfer them to vocational training facilities, pay them some salary, and help them get jobs.

(9) Export Promotion

(10) Reduction of Domestic Pulp Wood Prices

(11) Improvement in Waste Paper Recycle System

12.3 RECOMMENDATIONS ON PRODUCTION CONTROL

(1) Quality Improvement

Improvement of paper quality in the long-term program will be achieved due to the following modifications of production process.

1) Each paper machine focusing on one paper grade only

2) Changing to semi-chemical hardwood pulp for fluting, instead of waste paper

3) Investments for improved product quality by installation of new equipment

(2) Cost Reduction

1) Reduction of the number of employees

2) Concentration of production on three paper machines and one of the two chemical recovery section only.

3) Utilization of domestic wood-resources for raw material

4) Increasing production and reducing shut-down time following market demand

5) Development of cost control system

6) Raising employees' moral for cost reduction

(3) Adjustment of the Number of Employees

(4) In-house Training and Educational Investment

The proposed new technology to be introduced will require substantial training of all staff of the mill.

The objective of the top management training is to develop the understanding on how an efficient organization works within the market economy with decentralized authority.

Middle management training will focus on developing the managerial skills as leaders of a team to continuously improve the performance of the department within their responsibility. The modernization of the Natron mill will result in new technologies as well as new methods on how the mill and equipment should be operated. The training program of the middle management and operators will develop those skills.

The total cost of foreign experts of this program is estimated to be DM800 thousand.

12.4 RECOMMENDATIONS ON MANAGERIAL CONTROL

(1) Raising a Sense of Market Economy

(2) Business and Capital Tie-ups with Multinational Pulp and Paper Companies

(3) Participation in Management

Business plan should be drawn up with the participation of every employee. At least in summary form it should be not only circulated among department directors but also notified to every employee. It should contribute to rousing employees' sense of participation in management.

(4) Divisional Organization

It is recommended before starting pulp production, to reorganize Natron into seven divisions which are profit centers. Each division makes its business plan and improves its operation on its own initiative. On the other hand, each division is responsible for its operations result. Such divisional (decentralized) organization is expected to make the organization more efficient and profitable, make each division's decision-making quick, and rouse employees' morale. The seven divisions are for example, pulp, PM1, PM3, PM4, converting plant, maintenance, and administrative (head quarter) divisions.

(5) How to Evaluate Each Division

In order to evaluate each division's financial performance, residual income (RI) should be used rather than division's ROI. RI is defined as follows:

$RI = \text{Divisional Income} - K * \text{Invested Capital in Division}$

Note: K is division's cost of capital or division's minimum ROI required

(6) Supervisory Board

Main function of the supervisory board is to control operational decisions made by

management team, so at least one board member should join management meeting for pre-audit. At least one of board members should be a full-timer to make its function more effective.

(7) Number of Employees

Long-term schedule to adjust number of employees should be drawn up in conformity with the long-term business plan.

(8) Getting out of Barter Transactions

One of problems of barter transactions is that, the amounts of sales and purchases booked have less credibility. In addition to government's aid mentioned above, it is necessary as an accounting measure that Natron properly arranges evidence and documents which can verify the amounts' fairness at any time.

(9) Accounting and Financial Issues

1) Format of financial statements

- a. It is better to be stated in comparative style of two years (this year and the last year).
- b. On income statement, cost of sales is listed first, and sales is listed next. The order should be reversed.

2) Selling, general and administrative expenses are included in cost of sales. Such accounting method will lead inventories and net income to be overstated. So those expenses should be separated from cost of sales, and charged on the year accrued as a period cost, not a product cost.

3) Fixed assets should be defined as equipment utilized with capital cost of over e.g. DM1,500 to make accounting procedure conservative and efficient. Idle capacity should be accounted for by utilization value, and the adjustment amount should be charged as a period cost instead of deferred normal depreciation.

4) Standard costing and break-even analysis

NATRON should adopt standard costing in the near future, to make a proper business plan and implement cost control systems. At the same time, break-even analysis should be utilized to grasp profitability by products, and prepare effective production and sales-mix strategies.

APPENDICES

7-IV Preliminary manning list

The manning list in the next few pages follows the new overall organisation structure proposed by Natron management. Because the purpose this list is only to estimate the total number of personnel needed for operating the mill, some common functions in Production and Technical Division have been combined under same headings, and some other simplifications have been made.

All the existing facilities excluding PM2, and PM5 are expected to be in normal continuous operation including wood handling, two pulping lines, chemicals recovery, four paper machines and the converting plants.

Proposed organisation structure

General Manager and secretary	7
Production and Technical Division	
Common	81
Pulp and Paper Sector	
Wood handling and Pulp Mill	239
Paper Mill	172
Sack and Bag Production Sector	133
Corrugated Board Sector	117
Maintenance Sector	362
Independent Expertise Division	8
Common Administrative Division	
Common	12
Marketing Sector	15
Development Sector	18
Economy Sector	12
Personnel Administration Sector	28
All total	1,204

Preliminary manning list

	Working schedule shifts/day	days/week	Manning in shift	Manning total
General Manager				1
Secretary and Administration				6
Total				<u>7</u>

Production and Technical Division

Common

Assistant for General Manager	1	5		1
Sector Manager	1	5		4
Quality control	1	5		30
Quality control	3	7	4	16
Marketing and sales	1	5		10
Accounting	1	5		8
Personnel	1	5		6
Secretary	1	5		3
Office	1	5		3
Total common				<u>81</u>

1 Pulp and Paper Production Sector

Wood handling and pulp mill

Superintendent	1	5		1
Foremen	1	5		3
Foremen	3	7	3	12
Office	1	5		3
Labour				
Wood yard	3	7	15	60
Digesting plant	3	7	6	24
Evaporator	3	7	3	12
Recovery boiler	3	7	5	20
Recaustising	3	7	4	16
Lime kiln	3	7	4	16
Crude oil production	3	7	2	8
Coal boiler plant	3	7	5	20
Turbine hall	3	7	2	8
Fresh water treatment	3	7	2	8
Effluent treatment	3	7	1	4
Cleaners	1	5		4
Reserve and dayworkers	1	5		20
Total woodhandling and pulp mill				<u>239</u>

Preliminary manning list

	Working shedule shifts/day	Manning days/week	Manning in shift	Manning total
Paper mill				
PM1				
Superintendent (PM1, PM3)	1	5		1
Foremen	3	7	1	4
Office	1	5		2
Labour				
Broke handling	3	7	2	8
Stock preparation	3	7	1	4
Paper machine	3	7	3	12
Winder	3	7	3	12
Packing	3	7	2	8
Paper storing	3	7	1	4
Dispatching	2	5	2	4
Cleaners	1	5		1
Reserve and dayworkers	1	5		4
Total PM1				64
Core manufacturing				
PM3				
Superintendent	1	5		1
Foremen	1	5		1
Labour				
Stock preparation	3	7	1	4
Paper machine	3	7	1	4
Winder and packing	3	7	3	12
Paper storing	3	7	1	4
Dispatching	2	5		1
Cleaners	1	5		1
Reserve and dayworkers	1	5		3
Total PM3				31

Preliminary manning list

	Working shifts/day	shedule days/week	Manning in shift	Manning total
PM4				
Superintendent	1	5		1
Foremen	3	7	1	4
Office	1	5		2
Labour				
Stock preparation	3	7	1	4
Paper machine	3	7	4	16
Winder	3	7	3	12
Packing	3	7	3	12
Paper storing	3	7	1	4
Dispatching	2	5		2
Cleaners	1	5		1
Reserve and dayworkers	1	5		5
Total PM4				63
Total paper mill				172

2 Sack and Bag Production Sector

Sector Leader				
Superintendent	1	5		1
Foremen	2	5	1	2
Office	1	5		2
Labour				
Operators	2	5	41	82
Material handling	2	5	2	4
Packaging	2	5	3	6
Sorting	2	5	8	16
Cleaners	2	5	2	4
Storing and dispatch	1	5		6
Dayworkers and reserve	1	5		10
Total sack and bag production plant				133

3 Corrugated Board Production Sector

Sector Leader				
Superintendent	1	5		1
Sales and customer service	1	5		10
Production planning	1	5		3
Accounting	1	5		2
Foremen	3	5	2	6
Office	1	5		2
Labour				
Corrugators	3	5	10	30
Box making	3	5	12	36
Materials handling	3	5	4	12

Preliminary manning list

	Working shedule shifts/day	Manning days/week	Manning in shift	Manning total
Cleaners	1	5		2
Dayworkers and reserve			10	<u>12</u>
Total corrugated box plant				117

Preliminary manning list

Working schedule Manning Manning
 shifts/day days/week in shift total

4 Maintenance Sector

Sector Leader	1	5		1
Secretary	1	5		1
Procurement	1	5		1
Sales	1	5		2
Engineers	1	5		4
Foremen	1	5		10
Work planning	1	5		4
Accounting	1	5		4
Office	1	5		4
Labour				
Mechanical maintenance	1	5		170
Mechanical maintenance	3	7	8	32
Electrical maintenance	1	5	8	40
Electrical maintenance	3	7	2	8
Instrument maintenance	1	5		30
Instrument maintenance	3	7	2	8
Civil works	1	5		30
Civil works	3	7	2	8
Road, garden maintenance	1	5		5
Total maintenance sector				<u>362</u>

Independent Expertise Division

Common				
Assistant for General Manager	1	5		1
Secretary	1	5		1
Office	1	5		6
Total common				<u>8</u>

Preliminary manning list

Working shedule Manning Manning
 shifts/day days/weel in shift total

Common Administrative Division

Common

Assistant for General Manager	1	5		1
Secretary	1	5		5
Office	1	5		6
Total common				<u>12</u>

1 Marketing Sector

Sector Leader	1	5		1
Export marketing	1	5		6
Domestic marketing	1	5		4
Transport	1	5		4
Total marketing sector				<u>15</u>

2 Development Sector

Sector Leader	1	5		1
Product Development	1	5		4
Investment planning	1	5		4
Engineering	1	5		6
Information System Development	1	5		3
Total development sector				<u>18</u>

3 Economy Sector

Sector Leader	1	5		4
Finance	1	5		2
Accounting	1	5		4
Budgeting	1	5		2
Toal economy sector				<u>12</u>

4 Personnel Administration Sector

Sector Leader				1
Lawyer				1
Public relations				1
Human resource development, training				3
Fire fighting	1	5		1
Fire fighting	3	7	2	8
Security	1	5		1
Security	3	7	2	8
Safety	1	5		2
Recruiting				2
Total personnel administration sector				<u>28</u>

Total Common Administrative Division

85

All total

1,204

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Appendix 9-1

Unit prices

	unit	used DEM/unit	coefficient	basic DEM/unit
Purchased raw materials				
			1	
OCC, domestic	t	135		135
OCC, imported	t	120		120
mixed wasre	t			
unbleached kraft pulp	ADt	750		750
roundwood, SW	m3smob	75		75
sawmill chips, SW	m3s			
roundwood, HW	m3smob	50		50
sawmill chips, HW	m3s			
testliner	t	720		720
sack paper	t	1400		1400
Chemicals				
			1	
CaCO3	kg	0.10		0.1
NaOH	kg 100%	0.60		0.60
NA2SO4	kg 100%	0.73		0.73
H2SO4	kg 100%	0.44		0.44
HCL	kg	0.30		0.30
rosin size	kg 100%	9.00		9.00
neutral size	kg	10.00		10.00
alum	kg	0.34		0.34
starch for paper machine	kg	1.80		1.8
wet strength agent	kg	6.00		6.00
colour for testliner	kg	9.00		9.00
silicon	kg	5.00		5.00
starch for corrugated board	kg	1.03		1.03
glue for corrugated board, bo	kg	3.79		3.79
printing colour for boxes	kg	10.00		10.00
Energy				
			1	
coal, 10.5 GJ/t	t	43		43
oil, light	t	650		650
oil, heavy	t	370		370
heat in process steam (coal)	GJ	5.0		5.0
electricity	kWh	0.10		0.10
Water and effluent				
			1	
fresh water	m3	0.038		0.038
effluent and sludge dumping	m3	0.19		0.19
Personnel				
			1	
production	manyenar	21600		21600
maintenance	manyenar	21600		21600
administratien	manyenar	43200		43200

Sales product prices, mill net

	unit	used DM/unit	coefficient	basic DM/unit
schrenz	t	352	1	352
corrugated products, rec. fibre	t	1320		1320
corrugated prod., NSSC+schr	t	1505		1505
corrugated products, NSSC	t	1620		1620
sacks	t	1720		1720
bags	t	3390		3390
MG paper	t	1150		1150
sack paper	t	1090		1090
NSSC fluting	t	672		672

Sales prices, delivered and mill net

	Mill net price DM/t	Transport, commission DM/t	Delivered price DM/t
schrenz	352	88	440
corrugated products, rec. fibre	1320	60	1380
corrugated prod., NSSC+schrenz	1505	60	1565
corrugated products, NSSC	1620	60	1680
sacks	1720	60	1780
MG paper	1150	100	1250
sack paper	1090	146	1236
NSSC fluting	672	117	789

Appendix 9-1

Variable Production Costs

Recycled fibre processing plant

	Unit	Unit price DM/unit	Unit consumpt. units/ADt	Unit cost DM/ADt
Raw materials total	t		1.25	169
OCC, domestic	t	135	1.25	169
OCC, imported	t	120	0.00	0
Mixed waste	t	0		0
Chemicals total				
Heat total	GJ			
steam to process	GJ			
steam to bp power	GJ			
Electric power total	kWh			26
purchased or condensing pow	kWh	0.10	260	26
bp power generation	kWh			
Other costs total				27
fresh water	m3	0.038	100	4
effluent treatment	m3	0.19	100	19
operation materials				4
Variable costs total, recycled pulp				222

Variable Production Costs**Unbleached kraft pulp**

	Unit	Unit price DM/unit	Unit consumpt. units/ADt	Unit cost DM/ADt
Raw materials total				403
roundwood, SW	m3smob	75	5.4	403
sawmill chips, SW	m3s	0		0
Chemicals total				44
CaCO ₃	kg 100%	0.10	27.0	3
NaOH	kg 100%	0.60	8.0	5
NA ₂ SO ₄	kg 100%	0.73	45.0	33
H ₂ SO ₄	kg 100%	0.44	4.2	2
other chemicals				2
Heat total	GJ		-2.7	3
steam to process	GJ	5.0	10.0	50
steam to bp power	GJ	5.0	1.7	8
fuel oil for lime kiln	GJ	15.5	1.6	25
steam from bark	GJ	5.0	-3.0	-15
steam from liquor	GJ	5.0	-13.0	-65
Electric power total	kWh		750	33
purchased or condensing pow	kWh	0.10	333	33
bp power generation	kWh		417	0
Other costs total				21
fresh water	m ³	0.038	70	3
effluent treatment	m ³	0.19	70	13
operation materials				5
Variable costs total, unbleached kraft pulp				504

Variable Production Costs

Semichemical pulp, before installing debarking

	Unit	Unit price DM/unit	Unit consumpt. units/ADt	Unit cost DM/ADt
Raw materials total				115
roundwood, HW	m3smob	50	2.3	115
sawmill chips, HW	m3s	0		0
Chemicals total				31
CaCO ₃	kg 100%	0.10		0
NaOH	kg 100%	0.60	5.5	3
NA ₂ SO ₄	kg 100%	0.73	33.0	24
H ₂ SO ₄	kg 100%	0.44	2.8	1
other chemicals				2
Heat total	GJ		2.3	11
steam to process	GJ	5.0	4.5	22
steam to bp power	GJ	5.0	0.8	4
fuel for lime kiln	GJ			0
steam from bark	GJ	5.0		0
steam from liquor	GJ	5.0	-3.0	-15
Electric power total	kWh		550	36
purchased or condensing pow	kWh	0.10	363	36
bp power generation	kWh		188	0
Other costs total				16
fresh water	m ³	0.038	50	2
effluent treatment	m ³	0.19	50	10
operation materials				5
Variable costs total, semichem. pulp without debarking				209

Appendix 9-1

Variable Production Costs

Semichemical pulp, after installing debarking

	Unit	Unit price DM/unit	Unit consumpt. units/ADt	Unit cost DM/ADt
Raw materials total				115
roundwood, HW	m3smob	50	2.3	115
sawmill chips, HW	m3s	0		0
Chemicals total				28
CaCO3	kg 100%	0.1		0
NaOH	kg 100%	0.60	5.0	3
NA2SO4	kg 100%	0.73	30.0	22
H2SO4	kg 100%	0.44	2.5	1
other chemicals				2
Heat total	GJ		0.8	4
steam to process	GJ	5.0	4.5	22
steam to bp power	GJ	5.0	0.8	4
fuel for lime kiln	GJ			0
steam from bark	GJ	5.0	-1.7	-8
steam from liquour	GJ	5.0	-2.8	-14
Electric power total	kWh		550	36
purchased or condensing pow	kWh	0.10	363	36
bp power generation	kWh		188	0
Other costs total				16
fresh water	m3	0.038	50	2
effluent treatment	m3	0.19	50	10
operation materials				5
Variable costs total, semichem. pulp with debarking				199

Variable Production Costs

Testliner

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	ADt		1.065	405
purchased unbleached pulp	ADt	750	0.320	240
own unbleached pulp	ADt	504		
processed recycled fibre	ADt	222	0.746	165
Chemicals total				87
rosin size	kg	9.00	5.0	45
neutral size	kg	10.00		0
alum	kg	0.34	15.0	5
starch	kg	1.80	5.0	9
colour	kg	9.00	3.0	27
other chemicals				1
Heat total	GJ			50
steam to process	GJ	5.0	8.5	42
steam to bp power	GJ	5.0	1.4	7
Electric power total	kWh		850	50
purchased or condensing pow	kWh	0.10	496	50
bp power generation	kWh		354	
Other costs total				28
fresh water	m ³	0.038	50	2
effluent treatment	m ³	0.19	50	10
operation materials				10
packaging materials				7
Variable costs total, testliner from purchased kraft pulp				619

Variable Production Costs**Fluting of recycled fibre**

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	ADt		1.060	235
processed recycled fibre	ADt	222	1.060	235
Chemicals total				19
starch	kg	1.8	10	18
other				1
Heat total	GJ		9.3	47
steam to process	GJ	5.0	8.0	40
steam to bp power	GJ	5.0	1.3	7
Electric power total	KWh		800	47
purchased or condensing pow	KWh	0.10	467	47
bp power generation	KWh		333	
Other costs total				28
fresh water	m3	0.038	50	2
effluent treatment	m3	0.19	50	10
operation materials				10
packaging materials				7
Variable costs total, fluting from recycled fibre				375

Variable Production Costs and Sales Margin

Schrenz

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	ADt		1.065	236
processed recycled fibre	ADt	222	1.065	236
Chemicals total				40
rosin size	kg	9.00	4.0	36
neutral size	kg	10.00		0
alum	kg	0.34	10.0	3
starch	kg	1.80		0
other	kg			1
Heat total	GJ		9.3	47
steam to process	GJ	5.0	8.0	40
steam to bp power	GJ	5.0	1.3	7
Electric power total	kWh		800	47
purchased or condensing pow	kWh	0.10	467	47
bp power generation	kWh		333	
Other costs total				28
fresh water	m3	0.038	50	1.9
effluent treatment	m3	0.19	50	9.5
operation materials				10
packaging materials				7
Variable costs total, schrenz				398
Sales price, mill net				352
Sales margin				-46

Variable Production Costs and Sales Margin

Semichemical fluting

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	ADt		1.065	212
Semichemical pulp excl.debar	ADt	209		
Semichemical pulp incl.debar	ADt	199	1.065	212
processed recycled fibre	ADt	222	0.000	0
Chemicals total				5
starch	kg			
other				5
Heat total	GJ		8.8	44
steam to process	GJ	5.0	7.5	37
steam to bp power	GJ	5.0	1.3	6
Electric power total	kWh		750	44
purchased or condensing pow	kWh	0.10	438	44
bp power generation	kWh		313	
Other costs total				28
fresh water	m3	0.038	50	2
effluent treatment	m3	0.19	50	10
operation materials				10
packaging materials				7
Variable costs total, semichem. fluting excl. debarking				121
Variable costs total, semichem. fluting incl. debarking				333
Sales price, mill net				672
Sales margin, excl. debarking				551
Sales margin, incl. debarking				339

Variable Production Costs and Sales Margin

Sack paper

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	ADt		1.060	535
Own unbleached pulp	ADt	504	1.060	535
Chemicals total				66
rosin size	kg	9.00	4.0	36
neutral size	kg	10.00		0
alum	kg	0.34	15.0	5
starch	kg	1.80	4.0	7
silicon	kg	5.00	0.4	2
wet strength agent	kg	6.00	2.5	15
other				1
Heat total	GJ		10.5	52
steam to process	GJ	5.0	9.0	45
steam to bp power	GJ	5.0	1.5	7
Electric power total	kWh		1200	83
purchased or condensing pow	kWh	0.10	825	83
bp power generation	kWh		375	
Other costs total				36
fresh water	m3	0.038	50	2
effluent treatment	m3	0.19	50	10
operation materials				10
packaging materials				15
Variable costs total, sack paper, own kraft pulp				772
Sales price, mill net				1090
Sales margin, sack paper				318

Variable Production Costs and Sales Margin

MG paper

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	ADt		1.060	795
purchased kraft pulp	ADt	750	1.060	795
own kraft pulp	ADt	504		
Chemicals total				49
rosin size	kg	9.00	4.0	36
neutral size	kg	10.00		0
alum	kg	0.34	15	5
starch	kg	1.80	4.0	7
other				1
Heat total	GJ		10.5	52
steam to process	GJ	5.0	9.0	45
steam to bp power	GJ	5.0	1.5	7
Electric power total	kWh		900	53
purchased or condensing pow	kWh	0.10	525	53
bp power generation	kWh		375	
Other costs total				41
fresh water	m3	0.038	50	2
effluent treatment	m3	0.19	50	10
operation materials				10
packaging materials				20
Variable costs total, MG paper, purchased kraft pulp				991
Variable costs total, MG paper, own kraft pulp				730
Sales price, mill net				1150
Sales margin, MG paper, purchased kraft pulp				159
Sales margin, MG paper, own kraft pulp				420

Variable Production Costs and Sales Margin

Corrugated board and boxes, recycled fibre, schrenz, purch.testliner
Year 2

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	t		1.060	478
testliner from purch. kraft pulp	t	619	0.329	203
fluting from recycled fibre	t	375	0.366	137
schrenz	t	398	0.366	145
testliner, purchased	t	720		0
semichem. fluting	t	333		0
credit for broke	t	135	-0.060	-8
Chemicals total				59
starch	kg	1.03	30	31
glue	kg	3.79	0.64	2
printing colour	kg	10	1.9	19
other chemicals				7
Heat, as steam, 11 bar	GJ	5.0	1.5	7
Electric power	kWh	0.10	182	18
Other costs total				40
operating materials				20
other				20
Variable costs of board and boxes, rec. fibre and purchased kraft pulp total				603
Sales price				1320
Sales margin of corr. board and boxes, rec. fibre and purchased kraft pulp				717

Variable Production Costs and Sales Margin

Corrugated board and boxes, semich fluting, purchased testliner, schrenz from PM2

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	t		1.176	428
testliner, purchased	t	720	0.365	262
schrenz	t	398	0.329	131
semichem. fluting, excl debark	t	121	0.482	58
semichem. fluting, incl debark	t	333		0
credit for broke	t	135	-0.176	-24
Chemicals total				59
starch	kg	1.03	30.0	31
glue	kg	3.79	0.64	2
printing colour	kg	10.00	1.9	19
other chemicals				7
Heat, as steam, 11 bar	GJ	5.0	1.3	6
Electric power	kWh	0.10	96	10
Other costs total				40
operating materials				20
other				20
Variable costs of board and boxes, semich.fluting excl. debarking, testliner and schrenz				543
Variable costs of board and boxes, semich.fluting incl. debarking, testliner and schrenz				646
Sales price incl. schrenz from PM2				1505
Sales margin of board and boxes, semich.fluting excl. debarking, testliner and schrenz				962
Sales margin of board and boxes, semich.fluting incl. debarking, testliner and schrenz				859

Variable Production Costs and Sales Margin

Corrugated board and boxes, semichem. fluting and purchased testliner

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Raw materials total	t		1.176	520
testliner, purchased	t	720	0.670	483
schrenz	t	398		0
semichem. fluting, excl debark	t	121	0.506	61
semichem. fluting, incl debark	t	333		0
credit for broke	t	135	-0.176	-24
Chemicals total				59
starch	kg	1.03	30	31
glue	kg	3.79	0.64	2
printing colour	kg	10.00	1.9	19
other chemicals				7
Heat, as steam, 11 bar	GJ	5.0	1.3	6
Electric power	kWh	0.10	96	10
Other costs total				40
operating materials				20
other				20
Variable costs of board and boxes, semich. fluting excl. debarking, testliner excl. schrenz				635
Variable costs of board and boxes, semich. fluting incl. debarking, testliner excl. schrenz				743
Sales price exl. schrenz				1620
Sales margin of board and boxes, semich.fluting excl. debarking, testliner excl. schrenz				985
Sales margin of board and boxes, semich.fluting incl. debarking, testliner excl. schrenz				877

Variable Production Costs and Sales Margin**Sacks**

	Unit	Unit price DM/unit	Unit consumpt. units/t	Unit cost DM/t
Paper	t		1.020	1398
purchased paper	t	1400	1.000	1400
own pulp, own paper	t	772		
credit for broke	t	120	-0.020	-2
Chemicals				34
glue	kg	1.03	27.5	28
printing colour	kg	10.00	0.52	5
other chemicals				
Heat	GJ	5.0	0.5	2
Electric power	kWh	0.10	104	10
Other costs				10
operating materials				10
other				
Variable costs, purchased paper total				1454
Variable costs, own pulp, own paper total				826
Sales price, mill net				1720
Sales margin, sacks of purchased paper				266
Sales margin, sacks of own pulp, own paper				894

TABLE 8-1
Variable costs of pulp

	Recycled fibre	Unbleached kraft pulp	Semi- chemical pulp, excl. debarking	Semi- chemical pulp, incl. debarking
	DM/ADt	DM/ADt	DM/ADt	DM/ADt
Raw materials	169	403	115	115
Chemicals	0	44	31	28
Purchased fuels	0	3	11	4
Purchased power	26	33	36	36
Other variable costs	27	21	16	16
	<u>222</u>	<u>504</u>	<u>209</u>	<u>199</u>

TABLE 8-2
Variable costs of corrugated board materials

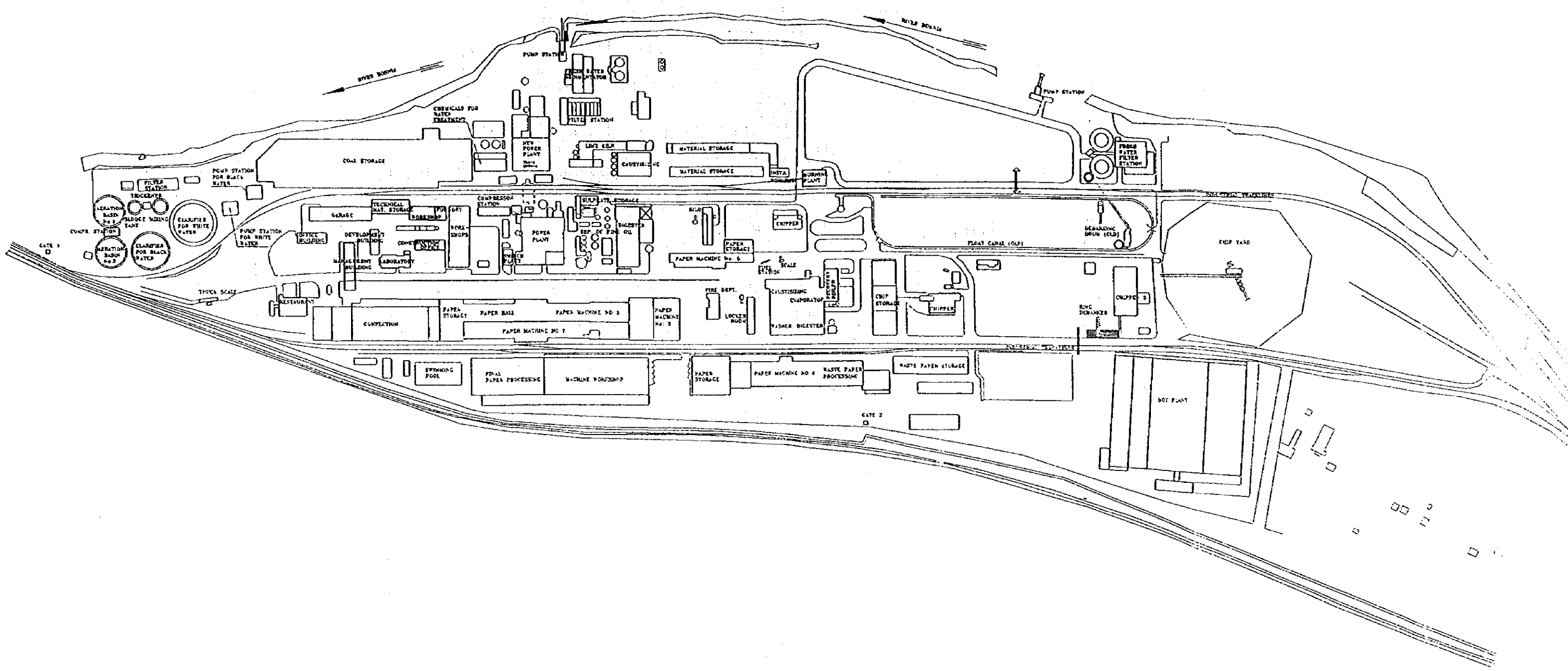
	Testliner	Fluting of recycled fibre	Schrenz	Semichem. fluting, excl. debarking	Semichem. fluting, incl. debarking
	DM/t	DM/t	DM/t	DM/t	DM/t
Pulp (variable costs)	405	235	236	0	212
Chemicals	87	19	40	5	5
Purchased fuels	50	47	47	44	44
Purchased power	50	47	47	44	44
Other variable costs	28	28	28	28	28
Total	<u>619</u>	<u>375</u>	<u>398</u>	<u>121</u>	<u>333</u>

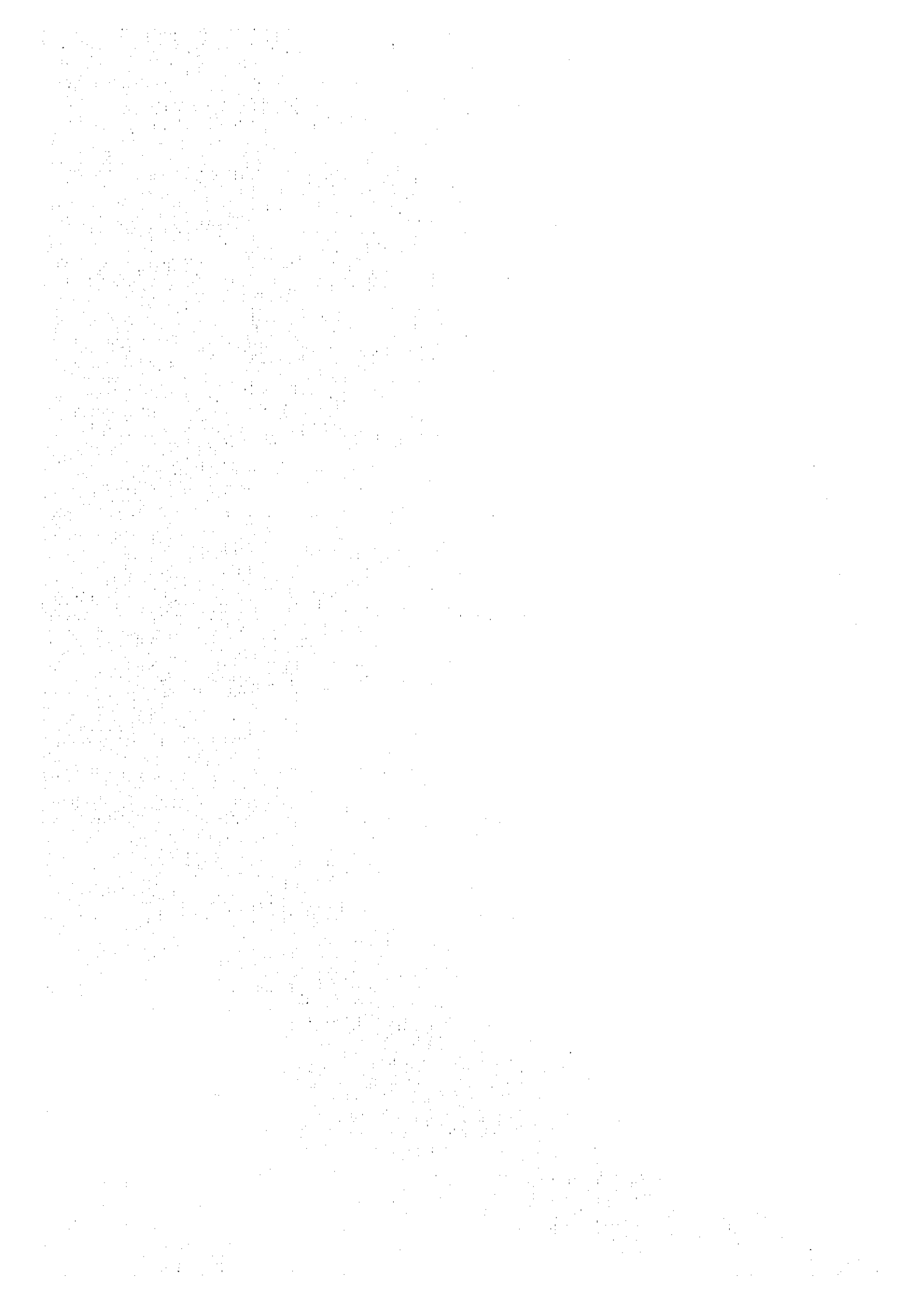
TABLE 8-3
Variable costs of sack paper and MG paper

	Sack paper	MG paper, purch. pulp	MG paper, own. pulp
	DM/t	DM/t	DM/t
Pulp (variable costs)	535	795	535
Chemicals	66	49	49
Purchased fuels	52	52	52
Purchased power	83	53	53
Other variable costs	36	41	41
Total	<u>772</u>	<u>991</u>	<u>730</u>

TABLE 8-4
Variable costs of converted products

	Corr. board recovered fibre	Corr. board virgin fibre	Corr. board schrenz + virgin fibre	Sacks, purch. paper	Sacks, own paper
	DM/t	DM/t	DM/t	DM/t	DM/t
Paper (variable costs)	478	520	428	1398	770
Chemicals	59	59	59	34	34
Purchased fuels	7	6	6	2	2
Purchased power	18	10	10	10	10
Other variable costs	40	40	40	10	10
Total	603	635	543	1454	826





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