
Chapter 7 MILL CONSTRUCTION PLAN

Chapter 7 MILL CONSTRUCTION PLAN

7.1 Mill Construction Plan

At each stage of the entire project implementation process, from "investment decision" by the implementation body (primary investor), to construction work and "commencement of commercial operation of the mill after completion, series of decisions are to be made, including selection of appropriate construction methods and implementation procedures from alternatives, and the establishment of methodology and assumptions required for the mill construction plan. This section summarizes the mill construction and its planning in the context of the decision making process.

(1) Preparation work and cost

1) Preparation work

The investment decision process starts from evaluation of "pre-investment study," which is assumed to be conducted in two parts, "preliminary (reconnaissance) study" and "detailed feasibility study." The pre-investment study focuses on project feasibility by performing a wide range of field surveys, assessment, analysis and evaluation in order to see whether the project meets a set of requirements for its successful implementation, including surveys to check availability of raw materials (including supply guarantee by state forest enterprises) and site conditions (including difficulty in land acquisition, e.g., ownership structure and legal restriction), environmental impact assessment, social study of local communities, and research and study of potential financial resources and investment incentives by government.

The pre-investment study is funded by the implementation body, which may be a consortium of business enterprises. The cost for the pre-investment study may be included in the asset of a new company established to operate the mill (i.e., construction in progress or other item) but is not included in the required investment estimated under this study.

When the investment decision is made on the basis of the result of the pre-investment study, the operating company must be established. This will require additional costs, as well as considerable time and effort. These costs

are not included in the required investment and will be left to the accounting policy of the primary investor.

2) Post investment decision

Investment for the proposed project is assumed to start upon the establishment of the operating company, and costs related to management of the company will be capitalized as the initial investment.

(2) Construction project team

The operating company will initially focus on implementation of the construction project and will be led by a construction project team of the implementation body. The project team will be reorganized over time as the project progresses. Toward the end of construction work, it will become a business organization capable of operating the mill with corporate management functions. In other words, the new company will expand its organization including employment, which will be ready for mill operation around six months before completion of the construction project.

Note that the organization of the implementation body including its size will vary with the type of construction contract that it chooses. If the implementation body is directly responsible for the entire project management process (including design, order, and work supervision), it needs to have a large organization including a design and engineering team. On the other hand, project management is entirely commissioned to a contractor on a turnkey basis, including basic design and engineering work, the implementation body itself can be a fairly small organization.

(3) Construction organization and type of contract

The mill construction project will be primarily managed by an experienced project management consultant (PMC) who will be responsible for basic engineering, procurement and construction management. Detailed design, installation and construction work will be awarded on an individual contract basis according to the unit or component of the mill.

Thus, the project implementation process will be managed by the PMC under the supervision of the project team of the implementation body. Work will be

measured and approved by the PMC on a completion basis, and the project manager of the implementation body will authorize payment to contractors. The PMC will partially be responsible for construction schedule, production capacity, equipment performance and product quality.

(4) Unit test run and commissioning

The test run will consist of non-load and partial load operations of each equipment to check that it meets design performance requirements guaranteed by the manufacturer. Each supplier will warrant, to the implementation body, mechanical performance of the component, equipment or system it delivers, as well as product quality. The PMC will check compliance on behalf of the implementation body. The supplier will be required to meet its performance requirements within a specific period and will be liable for remedial action to repair any defect, with penalty for non-compliance, including liquidated damage.

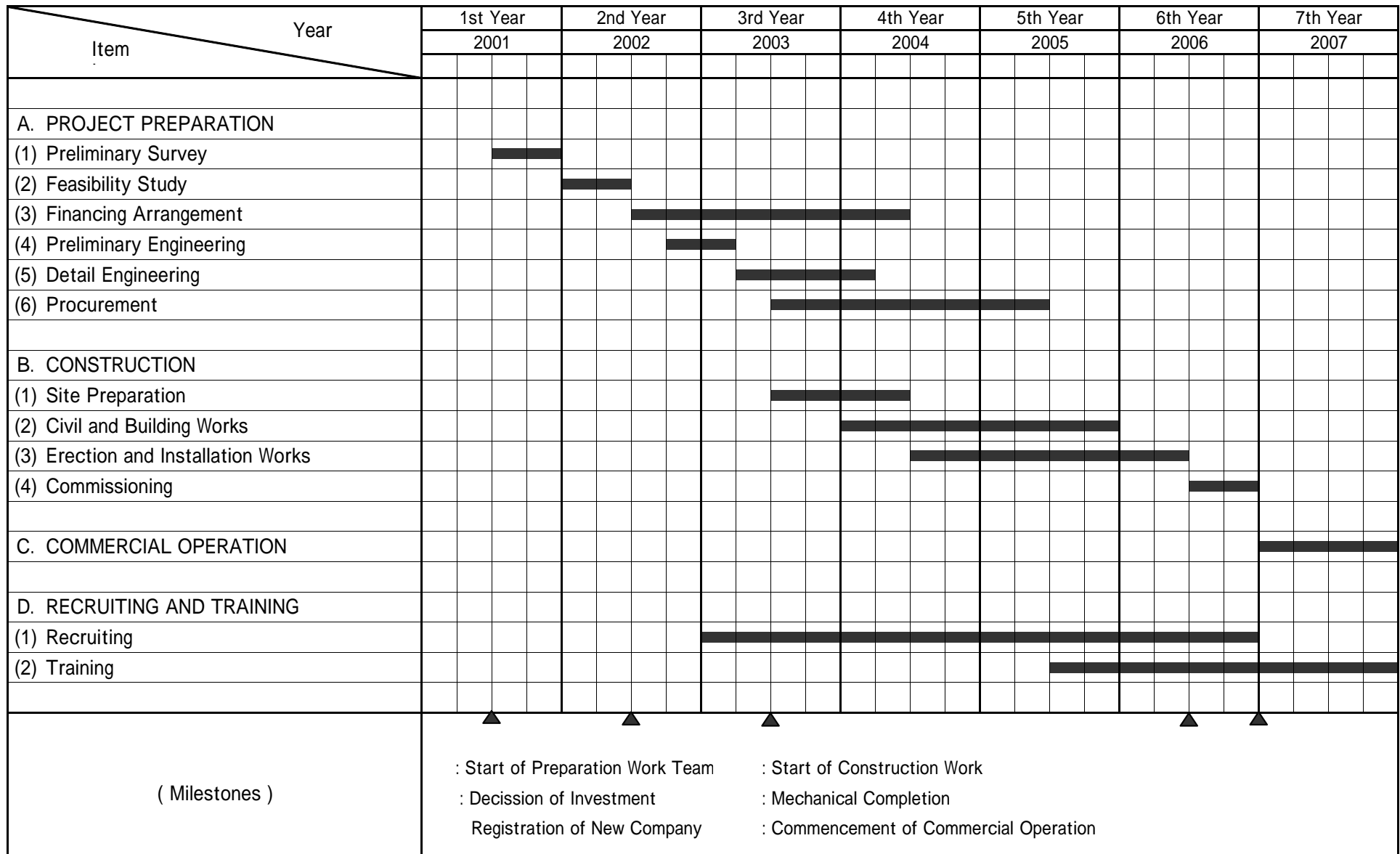
Upon completion of mechanical test runs and partial non-load operation, commissioning of the entire plant will commence. During the commissioning period, the mill will be operated by staff of the implementation body (operators and supervisors) under assistance of engineers of the PMC and unit suppliers. Commissioning completes when the mill is operated continuously for a specific period of time and commercial operation will commence.

7.2 Construction schedule

The preliminary construction schedule is shown by milestones of key activities as follows (see Figure 7.2.1).

<u>Activity</u>	<u>Milestones (start and end) (counted by months from the project commencement)</u>
I. Preparation work	
a. Preliminary study	0 - 6
b. Feasibility study	6-12
c. Financial planning	12-36
d. Basic design and engineering	15-21
e. Detailed design	21-33
f. Procurement of equipment and materials	24-48
II. Construction work	
a. Site preparation	24-36
b. Building construction/structural work	30-54
c. Equipment installation	36-60
d. Commissioning	60-66
III. Commencement of Commercial Operation	66-
IV. Employment and Training	
a. Recruitment and hiring	18-66
b. Education and training	48-

Figure 7.2.1 Construction Schedule



Chapter 8 TOTAL REQUIRED INVESTMENT AND FINANCIAL PLAN

Chapter 8 PROJECT COST ESTIMATE AND FINANCING PLAN

8.1 Project Cost Estimate

(1) Major Assumption for the Estimate

1) Basic Estimate

The basic estimate for this pulp mill were made by Jaakko Poyry of Sweden, in June 2000, according to the technical specification prepared by JICA team, and those basic data of the study are attached as “APPENDIX 8-1 BASIC ESTIMATE” and “APPENDIX 8-2 SPECIFICATION FOR ESTIMATE” at the end of this report.

2) Scope of Estimate

The estimate includes a new pulp mill having a capacity of 500000 ADt/a, with the auxiliary departments and facilities within the mill site, as follows:

- Wood handling and chip screening
- Pulp preparation line
- Pulp drying and baling
- Recovery & Power
- Chemical preparation
- Common mill systems
- Service departments
- Mill site

3) Exchange Rates

The calculations are based on the exchange rates, valid in April 2000.

1 USD = 4.00 LTL (Lithuanian litas)

1 USD = 107 JPY (Japanese yen)

1 USD = 8.8 SEK (Swedish kronor)

1 USD = 6.32 FIM (Finnish mark)

1 USD = 0.94 EUR (European euro)

4) Cost level

The cost level of the estimate is the second quarter of 2000.

The prices of machinery and equipment correspond to the price level of the offers with the fixed prices in the 2nd quarter of 2000, and also the price level of the building costs corresponds to the level on which a fixed price contract could be agreed during the 2nd quarter of 2000.

(2) Total Investment Cost

1) Land acquisition cost

Land areas for the pulp mill, receiving and storing of pulp wood, product storage, and utility facilities are required of 200 ha, and the land cost is estimated as 300 thousand USD.

2) Site preparation cost

The site preparation cost inclusive of cutting down trees, grubbing, cutting and filling, and site grading is estimated at 26083 thousand USD (23475 thousand USD for Foreign Portion and 2608 thousand USD for Local Portion).

3) Plant construction cost

The plant construction cost is estimated at 601984 thousand USD, and the breakdown of the foreign and local portions is shown in the following table.

Table 8.1.1 Breakdown of Plant Construction Cost

(Unit: USD 1000)

Item	Foreign Portion	Local Portion	Total
1. Civil and Building Works	102374	11375	113749
2. Machinery and Equipment	278398	8495	286893
3. Piping Work	27737	1632	29369
4. Electrical Equipment	29988	1489	31477
5. Process Control	18811	785	19596
6. Painting and Insulation	5435	1034	6469
7. Ventilation Work	11243	1249	12492
8. Temporary Facilities and Services	15400	6600	22000
9. Engineering	35340	2660	38000
10. Project Management ^{*)}	27000	3000	30000
11. Cost outside the Mill Fence	9551	2388	11939
Total	561277	40707	601984

Note: Project Management consists of Construction Management, Site Supervision and Administration.

4) Pre-operation expenses

Pre-operational expenses incurred prior to commercial operation and originated during the various stages of project formation and implementations are estimated at 11939 thousand USD.

The breakdown of major cost items is shown below.

- Mill personnel salary costs:	66 %
- Training materials, external training services, travels:	11 %
- Training and commissioning (suppliers and consultant):	15 %
- First fill and clothing, consumables during start-up:	8 %

Loss of material and utilities is included in the above cost items.

5) Contingency

To cover minor changes in the technical concept and to compensate for possible inaccuracies in the calculation, an allowance of approximately 7 % (approximately 6.8 % for foreign portion and approximately 9.3 % for local portion) has been added.

6) Initial working capital

Initial working capital is the funds required for initial inventories and operation prior to the generation of cash by sales. It is estimated in the following manner.

Inventory

- Raw materials:	60 days
- Chemicals and packing:	30 days
- Products:	15 days at cash factory cost
Account receivable:	30 days at total sales revenue
(Minus) Account payable:	(-) 30 days at variable cost

This initial working capital excludes the costs for spare parts, because these costs are included in the plant construction cost.

7) Custom duties

Capital goods including paper/pulp making machinery, steel structures, aluminum structures are exempted from import duties, and so no import duties are considered for this estimate of the investment cost.

8) Value added tax (VAT)

The VAT of 18% will be imposed on the local portion such as locally purchased materials and sub-contracting works.

9) Interest During Construction (IDC)

IDC is estimated on the basis of the conditions stated in the following chapter “8.2 Financing Plan”, that is, Debt/Equity Ratio of 70:30, interest rate at 10% per annum, and disbursement schedule for loans as enumerated below.

Table 8.1.2 Disbursement Schedule

Year		Disbursement Schedule (%)
1 year	(0.5)	21.70
2 year	(1.0)	28.10
3 year	(1.0)	32.05
4 year	(1.0)	18.15
Total	(3.5)	100.00

The calculation of IDC is shown in Table 8.1.1.

10) Total investment cost

The total investment cost is calculated at 855675 thousand USD, and is broken down by supply portion as follows:

Table 8.1.3 Total Investment Cost

(Unit: USD 1000)			
Items	Foreign Portion	Local Portion	Total
a. Land Acquisition Cost	0	300	300
b. Site Preparation Cost	23475	2608	26083
c. Plant Construction Cost	561277	40707	601984
d. Spare Parts	9798	515	10313
e. Pre-operating Expenses	9750	5250	15000
f. Physical Contingency	41334	4591	45925
g. Value Added Tax (18%)		9715	9715
Base Project Cost (BC)	645634	63686	709320
h. Initial Working Capital	0	27420	27420
i. Interest During Construction	118935		118935
Total	764569	91106	855675

Note: Spare parts required for 2-years operation is estimated.

8.2 Financing Plan

At the present, the sources of funds as well as terms and conditions for loans are unknown yet. Nevertheless, for the financial analysis, the financial plan for the project is assumed as follows:

(1) Debt-Equity Ratio

Assuming a Debt-Equity Ratio of 70:30, it is projected that 70% of the total investment cost be financed with long-term loans and 30% be financed with equity capital, and the long-term loan be borrowed from a foreign country(s).

(2) Terms and conditions of Long Term Loans

1) Terms of repayment

The principal of the loan is repaid, after 3.5 years construction period, with 20 semi-annual installments for 10 years starting from the commencement year of commercial operation.

2) Interest

$\text{Libor} + 2 \sim 2.5\% = 10\%$ per annum

For recent Libor (London Interbank Offered Rate), refer to Figure 8.2.2.

(3) Short Term Loan

Any deficiency in fund flow accrued during the operation will be financed with short-term loans.

The terms and conditions of the short-term loans are assumed as follows:

1) Terms of repayment: Within 12 months

2) Interest: 14.7% per annum

(The short-term interest rates of commercial banks in Lithuania in mid-2000 projected by regression analysis, based on the 1998 and 1999 trends, refer to Figure 8.2.2).

Table 8.2.1 Disbursement and Interest During Construction

1. TOTAL INVESTMENT COST

Item	%	Investment Cost (USD 1000)
Debt	70.0	598973
Equity	30.0	256702
Total	100.0	855675

2. INTEREST RATE

Interest Rate : 10% per year

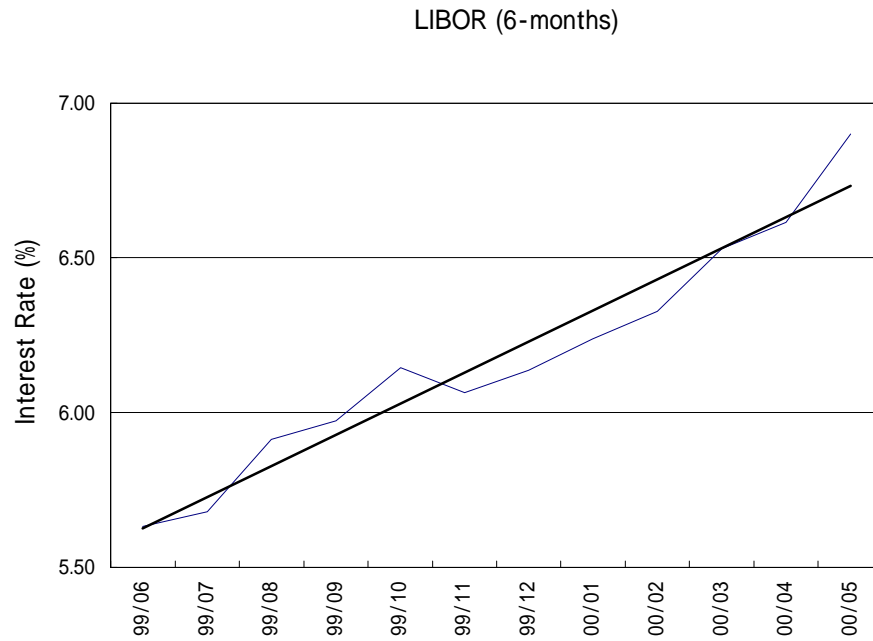
3. DEBT PORTION DISBURSEMENT

Year (Number of year)	%	Disbursement (USD 1000)
1st year (0.5)	21.7	129961
2nd year (1.0)	28.1	168336
3rd year (1.0)	32.1	191960
4th year (1.0)	18.1	108716
Total (3.5)	100.0	598973

4. SUMMARY OF INTEREST DURING CONSTRUCTION

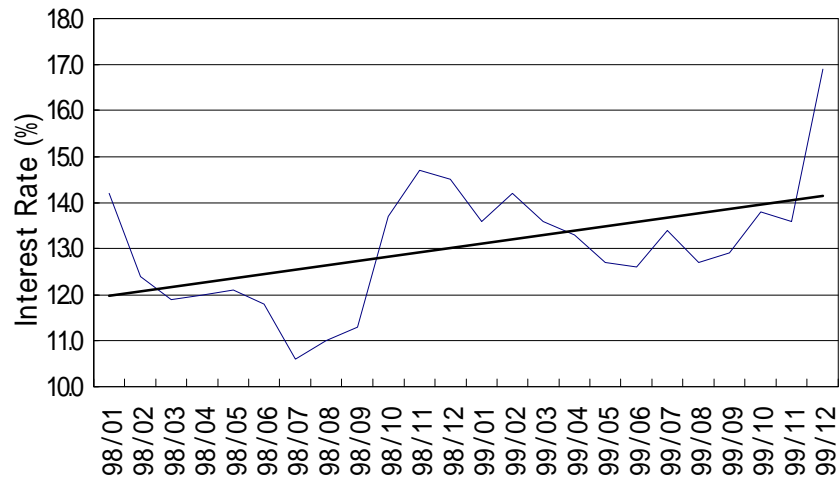
Year	Interest (USD 1000)
1st year	3249
2nd year	21527
3rd year	40181
4th year	53978
Total	118935

Figure 8.2.1 Libor (1999.5 ~ 2000.5)



Source: Mortgage (ARM) Indexes

Figure 8.2.2 Short-term Interest in Lithuania (1998 - 1999)



Source: Data provided by the Bank of Lithuania

APPENDIX 8-1

BASIC ESTIMATE

EJR

June 14, 2000

1 (1)

LITHUANIAN PULP MILL

CAPITAL COST ESTIMATE

CONTENTS	1	Basis of Calculation
	2	Summary of Capital Costs

ANNEXES	1	Summary of Pulp Mill Estimate
	2	Foreign and Local Costs
	3	Capacities of Process Areas

DISTRIBUTION

Rev.	Date/Checked	Date/Approved	Date/Issued	Notes
Orig.		A8 - 3		Original issue

1 BASIS OF CALCULATION

General

The capital cost estimate for a new pulp mill is based on the process balance calculation and technical specifications received from UNICO. The design capacities of the process areas are presented in annex 3.

The proposed accuracy of the estimate is +10...-15 %.

The estimate includes a new pulp and paper mill with the auxiliary departments and facilities within the mill site, as follows:

Pulp mill, capacity 500 000 ADt/a:

- Wood handling and chip screening
- Pulp preparation line
- Pulp drying and baling
- Recovery & Power
- Chemical preparation
- Common mill systems
- Service departments
- Mill site

Exchange rates

The calculations are based on the exchange rates, valid in April 2000:

1 USD = 4,00 LTL (Litas)

1 USD = 107 JPY Japan

1 USD = 8,8 SEK Sweden

1 USD = 6,32 FIM Finland

1 USD = 0,94 ECU

Cost level

The cost level of the estimate is the second quarter of 2000:

The prices of machinery and equipment correspond to the price level of the offers with the fixed prices in the 2nd quarter of 2000.

The price level of the building costs corresponds to the level on which a fixed price contract could be agreed during the 2nd quarter of 2000.

Civil Works

The civil costs are based on file information of JAAKKO PÖYRY and on the site survey in Lithuania.

Machinery

The machinery and equipment costs are based on the preliminary specifications and on cost file prices. The freight and erection costs have been included in machinery costs. The main supplies include also start-up and training costs.

Piping

The costs include pipes, fittings, pipe supports, hand valves and insulation.

Electrical

The main switchgear of 110 kV and 20 kV cable to the site is included in the costs outside of mill fence. The transformers, MCC's, AC motors, variable speed drives, power and control cables and lighting costs are included in the estimate.

Process control

The costs of field instruments, control and on-off valves, distributed control system and quality control systems are included in the estimate. The machine control costs are mostly included in machinery costs of main suppliers.

Erection costs

The specified labor costs are complete contractor costs including wages, fringe benefits, insurance expenses, contractor's overhead and profit.

Indirect costs

The costs have been estimated from previous similar projects.

The temporary facilities and services, engineering, construction management, site supervision, project administration, owner's costs, start-up and training costs are included in the estimate.

Costs outside the mill fence

The costs are included in the pulp mill costs and include the following costs:

- Railroads access to the mill site
- Road access to the mill site
- Raw pumping station and inlet pipe
- Effluent outlet pipe
- 110 kV switchgear and 20 kV cable to the site
- Gas reduction station and gas inlet pipe

The transportation of goods is supposed mainly done by railroads. No harbor warehouse for finished goods is included in estimate.

The costs of the apartments and houses of the mill personnel are not included in the es-

estimate, because the best site alternatives are relatively close some population center.

Contingency

To cover minor changes in the technical concept and to compensate for possible inaccuracies in the calculation, an allowance of approx. 7 %, has been added.

Exclusions

The following costs are not included in the estimate:

- Working capital
- Interest during construction
- Taxes, duties, licenses
- Escalation after 2nd quarter of 2000
- Financing costs

2 SUMMARY OF CAPITAL COSTS

PULP MILL

The estimated total cost for the pulp mill is 698 million USD.

The cost includes the land acquisition cost and the costs outside the mill fence.

ESTIMATES BY PROCESS AREAS

The investment cost summaries by process areas are presented in the annex 1:
Summary of pulp mill estimate

FOREIGN AND LOCAL COSTS

The breakdown of the foreign and local costs is presented in the annex 2.

ANNEX 1

SUMMARY OF PULP MILL ESTIMATE

JAAKKO PÖYRY
Investment Estimate
Cost Summary

Lithuanian Pulp Mill

1000 USD.

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Area	Description	0 Unclassified	1 Civil Works	2 Machinery	3 Piping	4 Electrical Equipment	5 Process Control	6 Painting & Insulation	7 Ventilation	9 Spare Parts	1 - 9 Total
1	Woodhandling		19 745	24 757	1 972	2 874	682	405	867	1 018	52 319
2	Pulp Line		5 168	87 890	9 637	5 452	6 386	2 217	1 030	4 974	122 754
3	Pulp Drying		19 696	43 481	3 220	5 594	3 288	686	3 164	1 201	80 330
4	Recovery & Power		28 413	82 286	6 253	9 694	4 194	1 946	2 838	1 728	137 354
5	Chemical Preparation		8 685	31 166	2 393	3 894	3 529	719	2 752	411	53 548
6	Common Mill Systems		22 951	7 383	1 789	1 809	972	189	103	515	35 710
7	Service Departments		8 393	5 216	249	103			1 739	252	15 952
8	Mill Site		26 083	3 937	3 855	2 058	546	306		189	36 975
	Subtotal		139 133	286 117	29 369	31 477	19 596	6 469	12 492	10 287	534 941
9	Indirect Costs:										
91	Temporary Facilities and Services	22 000									22 000
92	Engineering	38 000									38 000
93	Construction Mgmt, Site Supervision, Administrative	30 000									30 000
94	Pre-operational Expenses, Training, Start-up	15 000									15 000
	Subtotal	105 000	139 133	286 117	29 369	31 477	19 596	6 469	12 492	10 287	639 941
100	Land Acquisition	300									300
101	Costs outside the Mill Fence	1 683	1 910	263	3 260	4 350	30	20	293	130	11 939
	Contingencies										45 820
	TOTAL										698 000
	Breakdown excluding contingency, %	16.4	21.7	44.7	4.6	4.9	3.1	1.0	2.0	1.6	100.0

JAAKKO PÖYRY
Investment Estimate
Cost Summary

Lithuanian Pulp Mill

1000 USD

Area	Description	0 Unclassified	1 Civil Works	2 Machinery	3 Piping	4 Electrical Equipment	5 Process Control	6 Painting & Insulation	7 Ventilation	9 Spare Parts	1 - 9 Total
1	WOODHANDLING										
10	Woodhandling, Common		447	2 058	1 972	2 874	682	405	867	168	9 472
11	Wood Receiving		550								550
12	Wood Yard		1 407								1 407
13	Debarking and Chipping		6 690	10 831						449	17 970
14	Chip Handling		9 070	10 082						337	19 488
15	Bark Handling		1 581	1 786						64	3 431
1	Total		19 745	24 757	1 972	2 874	682	405	867	1 018	52 319
2	PULP LINE										
20	Pulp Line, Common								1 030		1 030
21	Cooking (Continuous digester) and Washing		1 737	44 949	353	891	1 351	56		3 103	52 440
22	Knot Separation and Pulp Screening		2 256	5 866	1 673	1 816	813	281		291	12 996
23	Oxygen Delignification		130	9 744	1 958	779	1 069	629		521	14 830
24	Bleaching ECF = (QZ)(PO)DD		1 045	27 332	5 652	1 966	3 153	1 252		1 058	41 458
2	Total		5 168	87 890	9 637	5 452	6 386	2 217	1 030	4 974	122 754
3	PULP DRYING										
30	Pulp Drying, Common		2 679						3 164		5 843
31	Bleached Stock Screening		2 068	2 550	1 044	277	352	321		139	6 751
32	Wet End and Drying		7 703	32 951	1 828	4 838	2 736	315		540	50 910
33	Cutting and Baling		2 822	7 980	348	480	200	50		522	12 403
34	Pulp Storage		4 424								4 424
3	Total		19 696	43 481	3 220	5 594	3 288	686	3 164	1 201	80 330

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JAAKKO PÖYRY
Investment Estimate
Cost Summary
Lithuanian Pulp Mill

1000 USD

Area	Description	0 Unclassified	1 Civil Works	2 Machinery	3 Piping	4 Electrical Equipment	5 Process Control	6 Painting & Insulation	7 Ventilation	9 Spare Parts	1 - 9 Total
4	RECOVERY & POWER										
40	Recovery & Power, Common		1 342						2 838		4 180
41	Evaporation		3 875	13 987	1 240	751	998	638		219	21 708
42	Recovery Boiler		14 151	38 708	2 306	2 559	1 862	620		577	60 783
43	Power Boiler		2 919	17 299	247	1 187	204	118		348	22 322
44	Feedwater Plant		621	2 446	370	787	359	83		146	4 813
45	Turbine Generator		3 967	8 898	1 978	233	712	468		344	16 600
46	Power Distribution		1 039			3 942				64	5 045
47	Compressed Air Plant			409	77	189	27	16		15	734
48	Fuel Storage		499	539	35	46	32	2		15	1 169
4	Total		28 413	82 286	6 253	9 694	4 194	1 946	2 838	1 728	137 354
5	CHEMICAL PREPARATION										
50	Chemical Preparation, Common		3 112						1 036		4 148
51	Recausticizing		3 833	11 068	186	891	1 069	214		88	17 350
52	Lime Reburning		1 007	7 041	408	516	643	91		44	9 749
53	Bleaching Chemicals Handling			938	146	98	94	92		46	1 415
54	NaClO3 Plant			5 361	965	643	429	96		54	7 548
54	Chlorine Dioxide Plant		714	3 855	98	118	174	84		81	5 125
55	H2O2 Preparation		19	79	40	28	40	8		11	225
56	Ozone Generation			2 824	550	1 599	1 079	133	1 716	87	7 988
5	Total		8 685	31 166	2 393	3 894	3 529	719	2 752	411	53 548

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JAAKKO PÖYRY

Investment Estimate

Cost Summary

1000 USD

Lithuanian Pulp Mill

Area	Description	0 Unclassified	1 Civil Works	2 Machinery	3 Piping	4 Electrical Equipment	5 Process Control	6 Painting & Insulation	7 Ventilation	9 Spare Parts	1 - 9 Total
6	COMMON MILL SYSTEMS										
60	Common Mill Systems, Common		250								
61	Raw Water Supply (outside the mill fence costs)								103		353
62	Fresh Water Treatment		4 726	1 232	577	253	154				
63	Cooling Water System		1 268	1 494	527	608	154			175	7 118
64	Effluent Treatment		16 457	3 398	527	789	380	75		99	4 225
65	Odor Abatement		250	1 259	158	159	284	83		179	21 813
6	Total							31		61	2 202
		22 951	7 383	1 789	1 809	972	189	103		515	35 710
7	SERVICE DEPARTMENTS										
70	Service Departments, Common		2 047								
71	Offices, Personnel Facilities		3 887	1 137	82	57			1 739		3 786
72	Laboratories			1 033	44					49	5 213
73	Maintenance Shops		2 459	2 050	123	45				53	1 129
74	Vehicles			997						100	4 778
7	Total									49	1 046
		8 393	5 216	249	103			1 739		252	15 952

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JAAKKO PÖYRY

Investment Estimate

Cost Summary

1000 USD.

Lithuanian Pulp Mill

Area	Description	0 Unclassified	1 Civil Works	2 Machinery	3 Piping	4 Electrical Equipment	5 Process Control	6 Painting & Insulation	7 Ventilation	9 Spare Parts	1 - 9 Total
8	MILL SITE										
80	Mill Site, Common		12 748	231		310					13 289
81	Fire Protection System		609			457					1 066
82	Roads, Areas		6 939								6 939
83	Railways 2 000 m		2 661								2 661
84	Fencing, Gates		360								360
85	Pipe Bridges		1 254	3 707	1 211			306		189	6 667
86	Underground Piping		1 512		2 644						4 156
87	Exterior Lighting					457					457
88	Telecommunication					694	546				1 240
89	Grounding Grid					139					139
8	Total		26 083	3 937	3 855	2 058	546	306		189	36 975
1 - 9	Subtotal		139 133	286 117	29 369	31 477	19 596	6 469	12 492	10 287	534 941

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ANNEX 2

FOREIGN AND LOCAL COSTS

LITHUANIAN PULP AND PAPER MILL

FOREIGN AND LOCAL COSTS

1000 USD -

Item	PULP MILL		
	Foreign	Local	Total
1 Land Acquisition		300	300
2 Site Preparation and Development	23 475	2 608	26 083
3 Civil Works	101 745	11 305	113 051
4 Machinery	277 645	8 472	286 117
5 Piping	27 737	1 631	29 369
6 Electrical Equipment	29 988	1 489	31 477
7 Process Control	18 811	784	19 596
8 Painting and Insulation	5 435	1 034	6 469
9 Ventilation	11 243	1 249	12 492
10 Spare Parts	9 773	514	10 287
11 Temporary Facilities and Services	15 400	6 600	22 000
12 Engineering	35 340	2 660	38 000
13 Construction Mngmt, Site Supervision, Administration	27 000	3 000	30 000
14 Preoperational Expenses (Traing and Start-up)	9 750	5 250	15 000
15 Costs outside the Mill Fence	9 551	2 388	11 939
Base Project Cost	602 894	49 286	652 180
16 Physical Contingency	41 238	4 582	45 820
17 Price Contingency			
18 Initial Working Capital			
19 Interest during Contruction			
Total Financing Required	644 132	53 868	698 000

ANNEX 3

CAPACITIES OF PROCESS AREAS

PULP MILL

Lithuanian Pulp Mill						
	Area	set	Name	unit	Nominal Design	
					NBKP	LBKP
	111-00		Wood Handling and Chip	sob m ³ /d	7 991	7 918
			Screening	sub m ³ /d	6 912	6 849
	111-01	2	Scale			
	111-02	5	Wood Storage Yard	days 30, m2	5 x 20000	
	111-03	2	Debarking Drum	sub m ³ /d	9 875	9 784
	111-04	2	Chipper	sub m ³ /d	9 875	9 784
	111-05	1	Chip Storage yard	days 5, m2	10 000	
	111-06	1	Chip Screen	sub m ³ /d	9 578	9 491
	115-00		Cooking	UKP ADt/d	1 611	1 927
			- Continuous digester			
			with impregnation vessel			
	116-00		Washing	UKP ADt/d	1 600	1 919
			- Pressure diffuser washer			
	117-00		UKP Screening	UKP ADt/d	1 586	1 899
		3	Pressure screens			
		1	DD washer			
	118-00		O ₂ Delignification	UKP ADt/d	1 555	1 864
			- 2 stages			
			- Washer Ø4,5x7 m			
	121-00		Bleaching	BKP ADt/d	1 500	1 801
			- ECF = (QZ)(PO)DD			
			- TCF = (Q(EOP)(PO)			
			- Diffuser or DD washer			
	127-00		Chemical Preparation			
	127-01	1	NaClO ₃ Electrolysis	NaClO ₃ t/d	22 *	
	127-02	1	ClO ₂ Gener. (R8)	ClO ₂ t/d	12.2	
	128-00	1	H ₂ O ₂ Preparation	H ₂ O ₂ t/d	6	
	129-00	1	O ₃ Generation	O ₃ t/d	14	
	122-00		BKP Screening	BKP ADt/d	1 493	1 789
		3	Pressure screens			
		1	DD Washer			
	122-02	1	BKP High Density Tower	BKP ADt/d	1 680	2 012
		1				
	131-00		Pulp Drying and Baling	BKP ADt/d	1 672	2 003
	131-01	1	Pulp M/C Wet Part	BKP ADt/d	1 672	2 003
		1				
		1				
	131-02	1	Pulp M/C Dry Part	BKP ADt/d	1 672	2 003
			- Air born dryer			
	131-03	1	Pulp C/T & Layboy	BKP ADt/d	1 672	2 003
	131-04	2	Bale Wrapping	BKP ADt/d	1 672	2 003
			- automatic wrapping			
			- bale press	ton	1 700	
			- wires 1 or 2			
	131-05	2	Bale Unitizing	BKP ADt/d	1 672	2 003
			- 2,76 m x 0,8 m	kg	2 000	
			- H= 1,8 m			
	139-00	1	Storage & Exped.	BKP ADt/d	0	0

141-00	1	Recovery Boiler	TS/d	2 771	3 061
		- steam production	steam t/h	351	357
		- temperature	C	515	
		- pressure	bar	111	
		El. precipitator			
142-00		Power Boiler	bark t/d	800	800
		(Bark Boiler)			
		- design prod., steam	t/h	110	110
144-00		Water Deionization			
		- demi Plant	kg/s		
		- condensate	kg/s		
143-02		Turbine Generator	MW	62.8	63.7
		- generator	MVA		74.9
147-00		Power Distribution	MVA		
151-00		Evaporation	H ₂ O t/d	13 911	15 366
			H ₂ O t/h	578	640
154-00		Causticizing	WL m ³ /d	6 067	6 884
			Dregs t/d		
			CaCO ₃ t/d		
			CaCO ₃ t/d		
157-00		Lime Kiln	CaO t/d	415	460
		- Demand	CaO/d	374	417
161-00		Water Treatment			
		- capacity	m ³ /d	72 000 *)	
163-00		Effluent treatment			
		- capacity	m ³ /d	54 000 *)	
		Cooling Tower	l/s		
600-00		Digital Control System			
		- Mill Wide Information			
		System			

*) estimated by JPH

M. SHIRAISHI

送信者 : Erkki Rissanen <Erkki.Rissanen@poyry.fi>
宛先 : <M.shiraishi@unico-intl.co.jp>
Cc: <HUB-Sthlm#c#JPC-Sthlm.JPQ#c#HL@poyry.fi>; <Leo.Ollikainen@poyry.fi>;
<Timo.Kytola@poyry.fi>
送信日時 : 2000年7月24日 16:22
件名 : Lithuanian Pulp Mill

RE: Fax received from Mr. Saito / 20.7.2000

WOOD HANDLING:

Additional cost for 4 chip piles instead of 2 ones is 1,5 million USD.

Best regards

Erkki Rissanen

APPENDIX 8-2

SPECIFICATION FOR ESTIMATE

May 15, 2000

INQUIRY SPECIFICATION
ON
THE ESTIMATE FOR CONSTRUCTION COST OF THE PULP AND PAPER MILL
IN
THE REPUBLIC OF LITHUANIA

1. General

This specification covers the estimate for construction cost of the pulp and paper mill in the Republic of the Lithuania.

2. Basic Design Concept

The basic scheme of the project is as follows.

A. Pulp plant

- 1) Type of pulp: paper grade NBKP and LBKP mainly for market pulp
- 2) Production capacity : 500,000 t/year (total)
- 3) Outlines of process: Continuous sulphate cooking process, 2 stages O₂ delignification and multi bleaching sequence for ECF or TCF will be applied.
- 4) Major equipment list:
 - Wood preparation and chip handling
 - Cooking
 - Washing
 - Brown stock (or UKP) screening
 - O₂ delignification
 - Bleaching
 - Chemical plant
 - Chlorate plant
 - Chlorine dioxide plant
 - Sulfur burning plant
 - Bleached stock (or BKP) screening
 - Pulp machine
 - Finishing and expeditizing
 - Black liquor evaporator
 - Recovery boiler
 - Auxiliary boiler (fuel and/or bark boiler)
 - Turbine generator
 - Causticizing
 - Lime kiln
 - Water treatment facilities

- Waste water treatment
- Solid waste treatment
- Air supply facility
- Power receiving, transforming and distribution equipment
- Proper control device and system including both hardware and software for each equipment and/or process

B. Paper plant

- 1) Type of paper: Fine paper especially PPC, made from NBKP (20~40%) and (60~80%)
- 2) Production capacity: 562 ADt/d and with 340 d/a 191,000 ADt/a, 5.2 m × 1180 m/min × 75g/m²
- 3) Outlines of process: Stock preparation room and a modern high speed paper machine followed with finishing line will be designed for the production of "PPC".
- 4) Major equipment:
 - Pulp storage facility
 - Pulp refining
 - Filler and internal sizing preparation
 - Start cooking
 - Other additives preparation
 - Stock approach
 - Machinery proper
 - Headbox (=Stockinlet)
 - Wire part
 - Press part
 - Pre-dryer part
 - Size press part
 - After-dryer part
 - Calendar part
 - Reel part
 - Winder
 - Paper machine control
 - Machine direction basis weight
 - Cross direction basis weight
 - Machine direction moisture content
 - Cross direction moisture content
 - Cross direction calliper
 - Auxiliaries and miscellaneous
 - Vacuum system
 - Dryer hood with air and waste heat recovery system
 - Drainage system (Dryer steam and condensate system)
 - Paper machine drive system
 - Lubrication system
 - Hot air circulation system
 - Machine drive unit
 - Machine room overhead crane

- Broke system
- White water system
- Finishing line
 - Sheet cutter
 - Steel wrapping equipment
 - Roll wrapping equipment
- Roll surface grinder room

C. Control system and device of Pulp and Paper Mill

- | | |
|----------------------------------|--|
| 1) Type of control system: | Electronics & Digital |
| 2) Capacity of system: | shall be specified and proposed by Jaakko Poyrr |
| 3) Outline of process: | |
| a) Instrumentation proper; | Every important equipment or unit machine shall be furnished with controlling monitoring and remote operation instrument (device) individually as much as necessary, including those designed especially for it by the supplier of equipment itself or others. |
| b) Process control; | Process control will be the function of a microprocessor based DCS (distributed control system) device with suitable operator interface units. |
| c) Mill-wide information system; | ① The "Individual instrument" control system and the ② "Process control DCS system " will be inter-connected to the mill-wide information system which will, for example in case of Paper Mill include the product roll identification and handling system, warehouse inventory and shipping control system and production planning system, and so on. |

3. Scope of Estimate

Scope of estimate shall include all machinery, equipment, materials and works including temporary works, required for the construction of Pulp and Paper Plant such as followings.

- 1) Land acquisition
- 2) Site preparation
 - Grubbing
 - Site grading, cutting and filling
 - Draining, reclamation of swamps etc.
- 3) Machinery and equipment
 - Plant machinery and equipment
 - Utility and auxiliary facilities
- 4) Spare parts and tools
- 5) Transport, insurance and port charges

- 6) Civil and building works
 - Chip handling building
 - Pulping buildings
 - Buildings for paper mill
 - Chemical plant
 - Electrolysis room
 - Electrolysis filter press room
 - Drying & finishing building
 - Pulp stock and expeditizing building
 - Evaporator
 - Causticizing building
 - Kiln room
 - Water treatment dehydration room
 - Boiler house
 - Turbine/Generator house building
 - Electric main station
 - Electric sub-station
 - Waste water treatment room
 - Sludge dewatering building
 - Canteen
 - Laboratory
 - Maintenance shop
 - Material warehouse
 - Chemical warehouse
 - Roads within plant site
 - Drainage and sewage disposal
 - Outdoor lighting
 - Fire fighting system
 - Landscape
- 7) Erection / installation of machinery and equipment
- 8) Outside facilities
 - Access road
 - Railway sidings
 - Water intake and pipeline
- 9) Temporary works and facilities for construction
- 10) Engineering services
 - Basic design
 - Detailed engineering
 - Civil and building design
 - Royalty for process license
- 11) Project management
 - Procurement
 - Construction

4. Currency and Exchange Rates

The estimate of plant construction cost shall be made in terms of U.S. Dollars for all charges, costs and prices also by applying a foreign exchange rate of US\$ 1.00 for 4.00 Litas of Lithuania's currency, and another currency exchange rates in April, 2000 are as followings.

1 US\$ = 8.80 SEK

1 US\$ = 6.32 FIM

1 US\$ = 0.94 ECU

1 US\$ = 105 JPY

5. Breakdown of Construction Cost

The breakdown of construction cost refers to Table - 1 and Table - 2 attached herein after.

6. Site Area Requirement

Total site area requirement is as follows.

a. Pulp Mill	100 Ha
b. Paper Mill	20 Ha
c. Extra area for future expansion	30 Ha
Total Area	150 Ha

No dimensioning is determined at this moment, but during the second field survey, we would like to discuss and determine dimensioning of the site area and major plant units as well. Planning of the plant layout will be made in the same time taking into account the actual conditions of an anticipated project site. Therefore, you are kindly requested to propose us certain practical case(s) in the similar country as Lithuania.

7. Other Conditions

In principle, your format for Investment Estimate is acceptable, subject to each cost should be divided into two portions of categories i.e. Foreign currency portion and Local currency portion as instructed in the above 5.

There might be found certain discrepancies in detailed specifications of equipment and facilities between the ones envisaged by our engineers and yours. Practical adjustments, if it may cause substantial influence to the result of financial viability, shall be made from time to time as required in the clarification of the detailed contents of the project plan during the field survey period.

For your Preliminary Schedule for the Study, we have no objection, but please understand that our final target to finalize estimation of the investment cost is the end of

June as indicated in the above 6. Please realize to keep such target date by all means.

8. Time Schedule

The time schedule of this estimating work is shown below.

Activity	May			June			July		
Inquiry Specification *)	---								
Estimate of Construction Cost									
Financial Analysis*)									

Note: Mark *) will be executed by Japanese Team.

Table -1 TOTAL INVESTMENT COST REQUIRED FOR PULP MILL IN LITHUANIA

(Unit: 1000 USD)			
Item	Foreign	Local	Total
1. Land acquisition	–	○ ×	○ ×
2. Site preparation and development	○ ×	○ ×	○ ×
3. Civil works	○	○	○
4. Machinery	○	○	○
5. Piping	○	○	○
6. Electrical equipment	○	○	○
7. Process control	○	○	○
8. Painting & insulation	○	○	○
9. Ventilation	○	○	○
10. Spare parts	○	○	○
11. Temporary facilities and services	○	○	○
12. Engineering	○	○	○
13. Construction management, Site supervision, Administration, Training and Start-up	○	○	○
14. Pre-operational expenses (Training, Start-up)	○	○	○
15. Costs outside of Mill fence	○	○	○
Base Project Cost (in 2000)	○ ×	○ ×	○ ×
16. Physical Contingency	○ ×	○ ×	○ ×
17. Price Contingency	×	×	×
18. Initial Working Capital	×	×	×
19. Interest During Construction	×	×	×
Total Financing Required	×	×	×

Notes : 1) Breakdown of foreign portion and local portion is necessary for the calculation of escalation in the financial analysis.

2) Mark (○) shall be estimated by JAAKKO POYRY.

3) Mark (×) will be estimated by UNICO.

Chapter 9 OPERATION PLAN

Chapter 9 OPERATION PLAN

9.1 Company Organization and Workforce

(1) Company organization and manning schedule

- 1) Company organization and manning plan is shown in Figure 9.1.1 company organization and manning table (in full operation) as per attached.
- 2) Entire organization of New Company for project performance is to be inaugurated as per Figure 7.2.1.
- 3) Numbers of employees are estimated workforce required in full operation and shown with member of Foreigners/Lithuanians separately.
- 4) Numbers of Foreigners' trainers who will be required during certain period after start up to reach full operation, are estimated separately, but is not shown in Figure 9.1.1.

(2) Estimate of wage cost per job category

- 1) Calculation basis of wage cost per job category of Lithuanians' employees.

Calculation way

- a. Based upon data of Dept. of statistics (APR. 1999, Pulp & Paper manufacture, Private Sector) as per attached separately. 2% of wage raise in 2000 is added on these figures.
- b. Manufacture of Pulp & Paper is ranked on the highest-level as well as manufacture of chemicals among all business categories.
- c. It is thought that there is no problem for recruitment as unemployment rate is high (11% in 1998, 1999). However in order to secure high quality works nation-widely, 10% is added on the above data taken into account of some allowance together with 2% wage raise.

Estimate of gross annual wage per job category

Gross wage includes all fringe benefit and overtime.

Table 9.1.1 Estimate of Gross Annual Wage per Job Category

Dept.	Post/Level	Estimate of Local Wage	USD/Y
Administ-	Manager	42000Lt × 110% = 46000Lt	11000
ration/	Deputy Manager	31200Lt × 110% = 34500Lt	8600
Sales, Mill	Supervisor	23000Lt × 110% = 25500Lt	6400
Operation	Foreman	16000Lt × 110% = 17600Lt	4400
	Worker	10000Lt × 110% = 11000Lt	2800
	Office Clerk	13800Lt × 110% = 15200Lt	3800
Forest	Manager (Senior)	60000Lt × 110% = 66000Lt	16500
	Deputy Manager	31200Lt × 110% = 34500Lt	8600
	Supervisor (Incl. Forester)	23000Lt × 110% = 25500Lt	6400
	Foreman (Incl. Scaler)	16000Lt × 110% = 17600Lt	4400
	Clerk	13800Lt × 110% = 15200Lt	3800

2) Estimate of gross annual wage per job category of foreigners' employees

Gross wage includes all fringe benefits.

Table 9.1.2 Estimate of Gross Annual Wage per Job Category

Dept.	Job Category	USD / Year
General Manager	CEO / COO	140000
Administration	Chief Financial Officer (CFO)	80000
	Controller	65000
	Mill Information System Manager	55000
Sales	Manager	50000
Mill Operation	Mill Manager	110000
	Production/Technical Manager	72000
	Supervisor	38000
	Foreman	34000
	Trainer	34000

Notes: CEO; Chief Executive Officer
COO; Chief Operating Officer
CFO; Chief Financial Officer

3) Yearly manning schedule in progress

According to Figure 7.1 yearly manning table in progress is scheduled as follows: (0.5 indicates hired employee in midway through the year.)

Table 9.1.3 Yearly Manning Schedule in Progress

Job Categories	Year	1	2	3	4	5	6	7	8
Lithuanian									
Manager (Sr.)			0.5	1	1	1	1	1	1
Manager				3	4	5	5	5	5
Deputy Manager				5	8	10	10	10	10
Supervisor				10	20	34	34	34	34
Foreman				20	75	104	104	104	104
Office Clerk				30	50	76	76	76	76
Worker					100	250	351	351	351
Sub-total		-	0.5	69	258	480	581	581	581
Foreigner									
General Manager (CEO/COO)			0.5	1	1	1	1	1	1
Chief Financial Officer (CFO)			0.5	1	1	1	1	1	1
Controller (incl.MIS)			0.5	1	1	1	1	1	1
MIS Manager				1	1	1	1	1	-
Sales Manager				1	1	1	1	1	1
Mill Manager			0.5	1	1	1	1	1	1
Production/Technical Manager			1	2	2	2	2	2	2
Supervisor				4	6	6	6	6	6
Foreman				2	5	5	5	5	5
Trainer						(0.5x1 2) 6	12	12	0
Sub-total			3	14	19	25	31	31	18
Total			3.5	83	277	505	612	612	599

(4) Numbers of Employees & Gross Annual Wage Rate per Department/Job Categories

Table 9.1.4 Number of Employees & Gross Annual Wage Rate per Departments/Job Categories

Job Categories	Number of Employees					Wage Rate (USD)	Annual Wage Cost (USD1000)
	Admini-strat'n	Sales	Mill Oper'n	Forest	Total		
Lithuanian							
Manager (Sr.)				1	1	16500	17
Manager	5				5	11000	55
Deputy Manager	8		1	1	10	8600	86
Supervisor	13	2	4	15	34	6400	218
Foreman			60	44	104	4400	458
Office Clerk	44	3	8	21	76	3800	289
Worker			351		351	2800	983
Sub-total	70	5	424	82	581	@3640	2106
Foreigner							
General Manager (CEO/COO)	1				1	140000	140
Chief Financial Officer (CFO)	1				1	80000	80
Controller (incl.MIS)	1				1	65000	65
MIS Manager	(1)				-	55000	-
Sales Manager		1			1	50000	50
Mill Manager			1		1	110000	110
Production/Technical Manager			2		2	72000	144
Supervisor			6		6	38000	228
Foreman/Trainer			5		5	34000	170
Sub-total	3	1	14		18	@54800	987
Total	73	6	438	82	599		3093
Employer's S.S Contribution						31%	959
Grand Total							4052
Cost per Pulp t (as 500,000t)							USD8.10

Table 9.1.5 Wage Level

1. Gross Wage Level per Job Categories

- Data of Dept. of Statistics, April, 1999: Pulp & Paper Manufacture, Private Sector -

Gross Wage incl. All Fringe Benefit, Overtime

Labor (LTL)			White Color (LTL)		
Monthly		Annual	Monthly		Annual
Unskilled	673	8100	Manager	2600	31200
Semi-skilled	827	9900	Sr. Specialist	1610	19200
Skilled	926	11100			
		@9700 (100)			
High-skilled	1309	15700	Clerk	1153	13800
Average	@890	10700	Average	1702	20400

Weighted Average of Basic Wage

Weighted Average		Labor, 20%	White Labor, 30%
Break-down	Overtime / Extra-work	-	- (Negligible)
	Annual Leave	8	8
	Bonus	12	22

(Note) Average wage level of pulp & paper manufacturing industries is at the highest level as that of the chemical industry among all business categories.

2. Distribution of the Employees by Gross Earnings' Groups (Process Industry)

(gross earning in the year of 1999)

LTL	%	Applicable Jobs Categories - attached	
600 under	34		
601-800	19	Unskilled	
801-1000	15	Semi-skilled	
1000-1200	10		Clerk
1200-1500	9	High-skilled	
1500-2000	6		Sr. Specialist
2000-3500	5		Manager
3500-5500	1		
5500 up	1		
	100		

Table 9.1.6 Wages per Job Categories in Sweden

Labour Costs in Scandinavia and Lithuania

Labour costs in Sweden are roughly estimated as follows. *Pulp and Paper Industry*

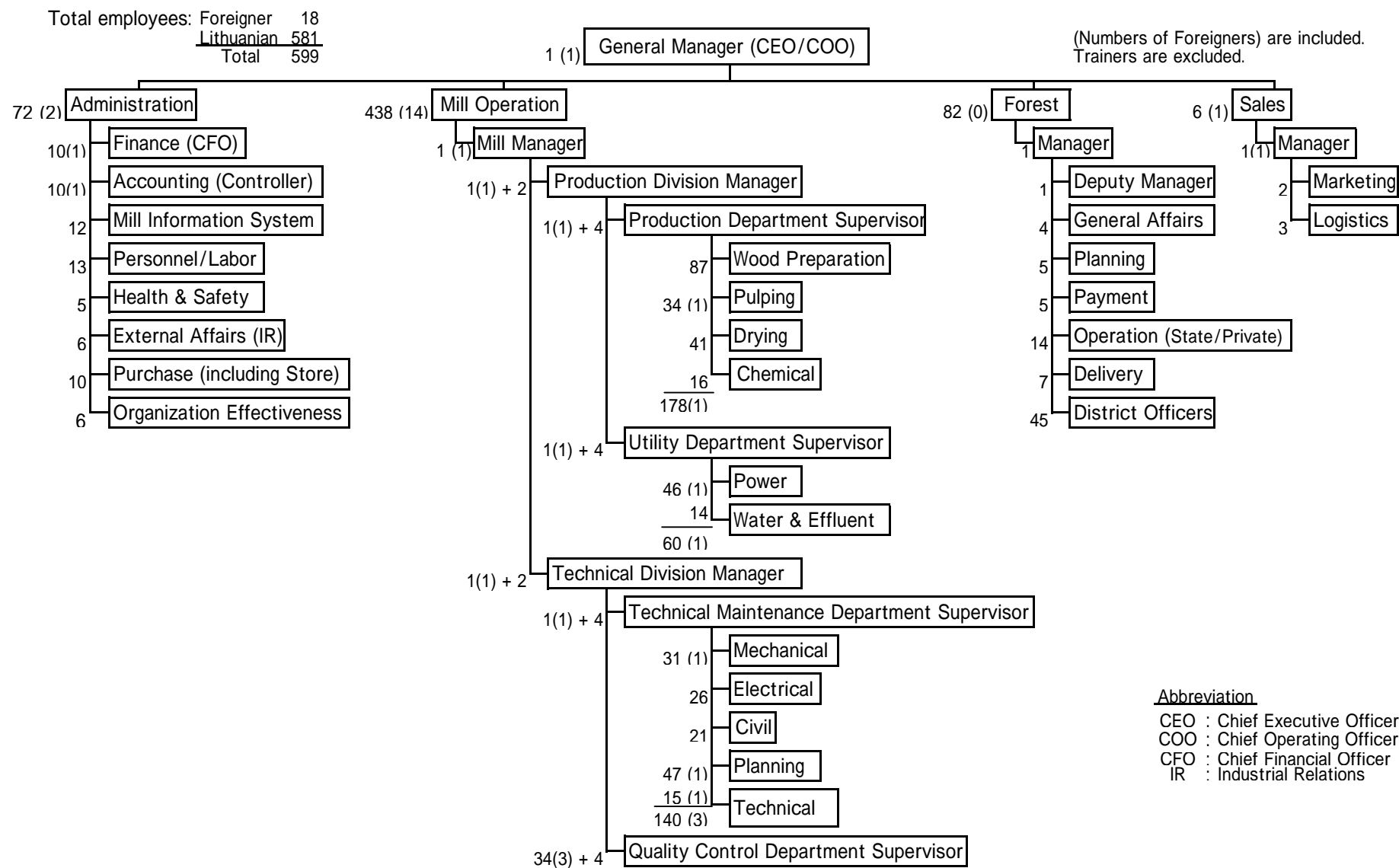
Category	Base monthly salary	Extra payment for shift work	Gross monthly salary	Estimated extra bonus	Gross annual salary	Employment fees and social charges		Gross labour cost to be paid by employer	
						1USD= 8.7 SEK			
	SEK/month	SEK/month	SEK/month	SEK/a	SEK/a	USD/a	%	SEK/a	Ratio
Worker	16000 ~ 18000	1000 ~ 2000	17000 ~ 20000	10000	214000 ~ 250000	24600 ~ 28700	45	310000 ~ 360000	100
Supervisor	18000 ~ 20000	1000 ~ 2000	19000 ~ 22000	10000	238000 ~ 274000	27400 ~ 31500	45	345000 ~ 395000	110
Production manager	40000 ~ 45000		40000 ~ 45000	10000	490000 ~ 550000	56300 ~ 63200	45	710000 ~ 800000	222
Mill Manager	60000 ~ 70000		60000 ~ 70000	10000	730000 ~ 850000	83900 ~ 97700	45	1060000 ~ 1235000	343
Administrat ion staff	15000 ~ 17000		15000 ~ 17000	10000	190000 ~ 214000	21800 ~ 24600	45	275000 ~ 310000	86
Administrat ion manager	30000 ~ 35000		30000 ~ 35000	10000	370000 ~ 430000	42500 ~ 49400	45	535000 ~ 625000	174

Some Lithuanian statistics can be found on Internet <http://www.kfez.lt/bendri/econo3.htm>

Reference 6/16 1 USD = 4 LTL

1 SEK = 0.46 LTL 8.7 SEK/USD

Figure 9.1.1 Company Organization and Manning table (in Full Operation)



9.2 Production Schedule

(1) Operation System

The modern BKP Mill will be operated continuously 24hours per day and 340 days through whole one year, and will have a general shut down (GSD) period rather long duration as of 20 days for example, if possible.

There will be held periodical maintenance for essential important equipment of mill like digester, recovery boiler, power boiler, steam turbine, generator and etc. during that GSD.

Furthermore some short shut downs as of a couple of days can be programmed intermediately for the maintenance of several equipment which need unexpected sudden repairs, but those short shut down might be passed, if unnecessary, and operation will be continued.

(2) Operation Days and Cycle

According to the supply forecast of both soft wood and hard wood for BKP Mill from the year of 2007 to 2020, the annual operation days for BSKP and BHKP production are specified 188 days and 152 days for each.

Actual operation cycle to switch the operation from BSKP to BHKP and from BHKP to BSKP contrary will be decided considering to minimize the intermediary products which are inevitable to occur in those cases.

As the result of energy balance calculation of BKP Mill shown in “ 6.5-(4) Energy Consumption and Balance ”, it is necessary to storage the excess of weak black liquor (WBL) during BSKP operation and to consume them to make-up the lack of weak black liquor (WBL) during BHKP operation instead of to consume fossil fuel like heavy oil or natural gas at Recovery Boiler.

Considering this condition we specified the capacities of WBL storage tank as of $10000\text{m}^3 \times 3\text{sets}$, and ten days BSKP operation and consequential eight days BHKP operation are assumed for the time being.

(3) Capacity Utilization Plan

1) 1st year after commencement of commercial operation (=start up) of Pulp Mil

The Capacity Utilization ratio of 1st six months will be 75% to the Designed Capacity as of 1471 ADt/d .

The Capacity Utilization ratio of 2nd six months will be 85% to the same.

The Capacity Utilization ratio of 1st year will be 80% to the same.

2) 2nd year after commencement of commercial operation (=start up) of Pulp Mil

The Capacity Utilization ratio of 3rd six months will be 90% to the same figure shown above.

From the beginning of 19th month after commencement of commercial operation (=start up) of Pulp Mill average daily production will reach to the designed figure.

The Capacity Utilization ratio of 2nd year will be 95% to the same.

(4) Production Schedule

The factors to decide Production Schedule of Pulp Mil are considered as follows;

Production Capacity

Demands of Market and Supply Conditions of Products

Supply Conditions of Raw Wood and other consumables

Production Capacity means generally production capacity of equipment and in case of green field construction of new pulp mill the Capacity Utilization ratio after commencement of commercial operation seems most important factor.

Production capacity of equipment is specified as 1350 ADt/d for BSKP, 1620 ADt/d for BHKP and 1471 ADt/d for Average.

Production Schedule is programmed assuming the Capacity Utilization ratio as 80% in the 1st year, 95% in the 2nd year and 100% from the beginning of the 3rd year.

We can't say about Demands of Market and Supply Conditions of Products and Supply Conditions of Raw Wood and other consumables just now, but most important thing is to focus every effort to achieve the Capacity Utilization ratio as of 100% as much as fast.

Details are shown in Table 9.2.1 and Table 9.2.2.

Table 9.2.1 1st Year (2007) Production

	Operation	Shut down Ratio		Production	
	days	days	% (1*)	ADt/d	ADt/mon.
January	27	4	70.0	1029	27794
February	28	0	70.0	1029	28824
March	27	4	70.0	1029	27794
April	30	0	79.0	1176	34853
May	28	3	80.0	1176	32941
June	30	0	80.0	1176	35294
Sub total	170	11	75.0	1103	187500
July	29	2	85.0	1250	36250
August	31	0	85.0	1250	38750
September	28	2	85.0	1250	35000
October	31	0	85.0	1250	38750
November	20	10	85.0	1250	25000
December	31	0	85.0	1250	38750
Sub total	170	14	85.0	1250	212500
Total	340	25	80.0	1176	400000

*1: Ratio to Designed Average Daily Production as of 1471 ADt/d

$$= (1350 \text{ SWBKP ADt/d} \times 188\text{d/a} + 1620 \text{ HWBKP ADt/d} \times 152\text{d/a}) / (188 + 152)$$

Table 9.2.2 2nd Year (2008) Production

	Operation	Shut down Ratio		Production	
	days	days	% (1*)	ADt/d	ADt/mon.
January	28	3	90.0	1324	37059
February	28	0	90.0	1324	37059
March	31	0	90.0	1324	41029
April	28	2	90.0	1324	37059
May	31	0	90.0	1324	41029
June	30	0	92.0	1353	40589
Sub total	176	5	90.3	1329	233824
July	31	0	100	1471	45588
August	31	0	100	1471	45588
September	30	0	100	1471	44118
October	31	0	100	1471	45588
November	10	20	100	1471	14706
December	31	0	100	1471	45588
Sub total	164	20	100	1471	241176
Total	340	25	95.0	1451	475000

Chapter 10 FINANCIAL ANALYSIS

Chapter 10 FINANCIAL ANALYSIS

10.1 Major Assumptions

(1) Currency and Exchange Rate

In this financial analysis, all charges, costs and prices are estimated in the U.S. Dollars, and the Lithuanian currency is converted into the U.S. currency at the following exchange rate.

USD 1.00 = 4.00 Lit

(2) Escalation

All charges, costs and prices indicated in this financial calculation are estimated as of the 2nd quarter of 2000 as the baseline date and no price escalation after the date is assumed.

(3) Project Life

The project is assumed to commence commercial operation in January 2007 after 42 months from the start of construction (refer to Attached Figure 7.2.1).

The project life for the financial analysis will be 18.5 years counted by adding 15 years after commencement of commercial operation to 3.5 years of construction period from July 2007 to December 2006.

(4) Retained Earnings (Dividends)

The surplus should be distributed by the 20% dividend, which started in the third year, depending on actual cash flow. The surplus after the dividend will be retained throughout the project period.

10.2 Production and Sales Plan

(1) Production, Inventories and Sales Plan

The mill will operate for 340 days per year.

The full pulp production capacity of is planned to be 500000 ADt/a (254257 ADt/a of BSKP and 245743 ADt/a of BHKP).

The capacity utilization rate will be average 80% in the 1st year of commercial operation, average 95% in the 2nd year and 100% after the 3rd year.

The product inventory level is equivalent to 15 days of production calculated on the basis of the annual production rate. The sales volume is estimated by subtracting an increase in inventory from an annual production volume.

Production and sales over the project life are summarized below:

Table 10.2.1 Capacity Utilization of Pulp Mill

			(Unit : %)
Project Year	Production	Increase in Inventory	Sales
1st	80	3.3	76.7
2nd	95	0.6	94.4
3rd	100	0.2	99.8
4th	100	0.0	100.0
-----	-----	-----	-----
14th	100	0.0	100.0
15th	100	(-)4.1	104.1
Total	1,475	0.0	1,475

(2) Product Selling Prices

1) Transportation costs

When the mill is sited in Jonava, transportation costs are estimated as follows:

a. Sea route transport

For inland transport

From the mill to Klaipeda port

(A) Rail way 288 km @USD 0.02 / t-km = USD 5.76 / ton

(B) Road 233 km @USD 0.05 / t-km = USD 11.65 / ton

Loading and unloading of truck USD 5.00 / ton

Shipment/Stevedoring charge USD 6.00 / ton

Ocean freight (Klaipeda - European Port)	USD 20.00 / ton
Total C&F (A)	<u>USD 36.76 / ton</u>
(B)	<u>USD 42.65 / ton</u>

b. Inland transportation by Truck

The nearest area (Central Germany):

DM 2000 / truck USD 39.75 / ton

Intermediate distance (Paris):

DM 3200 / truck USD 63.44 / ton

Long distance (North Italy):

DM 3500 / truck USD 69.64 / ton

As volume discount can be expected for truck freight and rail/truck intermodal transport may be available (no data were obtained, but expected to be much cheaper than truck transport), the overall transportation cost can be assumed to be approximately USD40.

2) Market Prices of Pulp

Recent market prices of pulp are as follows:

Month	BSKP (USD / ADt)	BHKP (USD / ADt)
April / May	670	640 ~ 650
June	700	670 ~ 680
July	720	690 ~ 700

The baseline price is established as of the second quarter of 2000, and the weighted average of April, May and June prices is calculated for each product:

BSKP : USD 680 / ADt

BHKP : USD 665 / ADt

3) Sales prices

As all products made at the proposed mill will be exported and will therefore not be subject to VAT, the standard ex-factory prices are assumed as follows:

BSKP : USD 640.0 / ADt

BHKP : USD 615.0 / ADt

10.3 Operating Cost

(1) Variable cost

As the project is assumed to export all products and is entitled to the reimbursement of the VAT on locally procured materials, such as pulpwood logs, electricity and natural gas, the VAT is not included in the financial analysis. Also, import duties on chemicals, packaging materials and other products are assumed to be exempted.

Variable costs at full capacity operation are estimated as follows.

Table 10.3.1 Variable Costs in Full Capacity Utilization

Item	Unit		Per Product		Annual	
	Unit	Unit price (USD/Unit)	Consumption (Unit/ADt)	Cost (USD/ADt)	Consumption (Unit)	Cost (USD1000)
Raw Materials						
- Softwood for BSKP	m ³	26.63	5.29755	141.07	1346939	35869
- Hardwood for BHKP	m ³	20.36	4.48453	91.32	1102041	22440
Sub total					2448980	58309
Auxiliary Materials						
- Chemicals for BSKP	ADt	21.11			254257	5367
- Chemicals for BSKP	ADt	16.37			245743	4023
- Packing	USD		2.50			1250
Sub total						10640
Utilities						
- Industrial Water	USD		1.50			750
- Electric Power	USD		0.7166			358
- Natural Gas	10 ³ m ³	85.75			25326	2172
Sub total						3280
Total						72229

(2) Fixed Cost

Fixed costs are shown below:

Table 10.3.2 Annual Fixed Cost

Item	Unit	Quantity	Unit Rate (USD or Rate)	Cost (USD1000)	Remark
Labor Cost					
- Salary and wages	Man-year	599		3093	Refer to Table 9-4
- Social insurances	USD	3093	0.31	959	"
Total				4052	
Factory Overhead	Lot	1		2026	50% on Labor Cost
Maintenance	USD1000	571655 ¹⁾	0.015	8575	1.5% on Direct Construction Cost of Pulp Mill
Tax and Insurance					
- Land tax	USD1000	328 ¹⁾	0.015	5	1.5% on Land Acquisition Cost
- Road tax	USD1000	313856	0.005	1569	0.5% on Sales Revenue
- Property tax	USD1000	144753 ¹⁾	0.01	1448	1.0% on Construction Cost of Building
- Natural resources	Lot	1		44	Refer to Table10-1
- Pollution tax					
a. Air pollutants	Lot	1		144	Refer to Table10-1
b. Water pollutants	Lot	1		126	"
c. Mobile resources	Lot	1		2	"
Sub total				272	
- Non-life insurance	USD1000	699605 ¹⁾	0.001	700	0.1% on Construction Cost
- VAT (18%)	USD1000	53971	0.18	9715	Only for Construction Cost
Total				13753	
Operation Advisors	Man-year	12	66810 ²⁾	802	Refer to Table 9-2,3,4
Grand Total				29208	

Notes: Figures with ¹⁾ include Contingency.

Figure with ²⁾ includes Salary and wages of USD34000/a, Social Insurances (31%) and Factory Overhead (50%).

Supplement: Regarding Assumption of Maintenance Cost

Maintenance Cost

Maintenance Cost: USD16.10/ADt

Maintenance cost of pulp mill are related to the quantity and property of equipment operating in the mill and need daily and periodical maintenance services.

The maintenance cost of pulp mill can spread in a range as of 1.0 ~ 3.0 % of the value or cost of the equipment under discussion per one year .

The realistic figure to be applied will depend on the several conditions which the pulp mill operation and her equipment will face to at the stage of actual operations in future, but it is very difficult to get an exact one supposedly normally.

In the case of “Green Field Mill” construction the quantity and property of equipment mentioned above will correspond to the “Direct Construction Cost of Pulp Mill” estimation of which was done already as a portion of our field survey by JPE in Finland.

Following to the estimation of JPE submitted to us on 20th of June 2000, the “Direct Construction Cost of Pulp Mill” is 536441 (1000USD).

We selected the figure as of 1.5 % of “Direct Construction Cost of Pulp Mill” assuming the quality of the operation and maintenance services of Pulp Mill could be rather moderate in this country.

Accordingly the annual maintenance cost of Pulp Mill will be 8032(1000USD), and as production cost it will be USD16.10/ADt.

This result of maintenance cost calculation dose not have any big allowance compared with the operation record of existing similar market pulp mill like CENIBRA in Brazil, where the reported maintenance cost was as of USD22.00 /ADt in the year of 1997.

Adding the contingency of about 7% to the above Direct Construction Cost of Pulp Mill, the maintenance cost for this financial analysis is set up as follows:

Direct Construction Cost of Pulp Mill :	536441 (1000USD)
Contingency (about 7%) :	35214 (1000USD)
Total	571655 (1000USD)
Maintenance Cost =	$571655 \times 1.5 / 100 = 8575$ (1000USD)
Unit Price per Product =	$8575000 \div 500000 = \text{USD}17.15 / \text{ADt}$

(3) Depreciation and Amortization

Fixed assets of this plant will be depreciated and amortized as follows:

Depreciation (Tangible fixed assets)

Method : Fixed installment method
 Salvage value : 0
 Service life

- Machinery & equipment : 10 years
- Utility facilities : 10 years
- Buildings : 20 years

Amortization (Intangible fixed assets)

Method : Fixed installment method

Amortizing year : 5 years

(4) Sales expenses

Sales expenses will be 1% of total sales revenue.

(5) Permanent working capital

The working capital after the starting of commercial operation is called “Permanent Working Capital”, which is calculated by deduction of current liabilities from current assets; minimum requirements for current assets and liabilities are as follows:

Current assets

Account receivable : 30 days at total sales revenue

Inventory of products : 15 days at cash factory costs

Inventory of raw materials : 60 days

Inventory of chemicals and packing : 30 days

Cash in hand : 30 days at cash factory costs

Current liabilities

Account payable : 30 days at variable cost

(6) Corporate Income Tax

The corporate income tax is 24%. The carry-forward is up to 5 years and no carry-back is allowed. For the project, the following tax incentives are assumed to be granted:

- a. 5 years after the start of commercial operation: Income tax exempted
- b. 6 – 10 years: 50% reduction

10.4 Results of Financial Analysis

Based on the above assumptions, financial statements covering the entire project life (base case) were prepared and are attached hereto in the form of computer output as Appendix 10, consisting of the following:

Financial statements including in APPENDIX 10 are as follows:

Table 1	PRODUCTION AND SALES PLAN
Table 2	PRODUCTION COST STATEMENTS
Table 3	WORKING CAPITAL STATEMENTS
Table 4	INCOME STATEMENTS (FOR ENDING DECEMBER 31)
Table 5	FUND FLOW STATEMENTS (FOR ENDING DECEMBER 31)
Table 6	BALANCE SHEETS (FOR ENDING DECEMBER 31)
Table 7	LOAN REPAYMENT SCHEDULE
Table 8	PROFITABILITY AND FINANCIAL INDICATORS
Table 9-1	FINANCIAL RATE OF RETURN (IN CONSTANT PRICE)
Table 9-2	FINANCIAL RATE OF RETURN ON EQUITY (IN CONSTANT PRICE)

Based on financial statements, the financial analysis of this project is made from two aspects, profitability and financial stability. As indexes for these analysis, financial internal rate of return (FIRR) and various financial ratios.

As for financial internal rate of return to evaluate profitability of the project, the Financial Internal Rate of Return On Investment (FIRROI) in constant price and the Financial Internal Rate of Return On Equity (FIRROE) in constant price are applied for indexes.

Indexes for financial ratios to evaluate financial stability of the project are Current Ratio, Quick Ratio, Debt Service Coverage Ratio (DSCR) and Debt Equity Ratio.

(1) FIRROI in Constant Price

From Table 9-1, the FIRROI is 19.02% before tax and 18.19% after tax.

Generally, the FIRROI after tax is used as a primary indicator of profitability on total investment. The FIRROI of 18.19% is considered to be feasible from the total investment point of view.

(2) FIRROE in Constant Price

From Table 9-2, the FIRROE is 24.71% before tax and 23.50% after tax. Like the FIRROI, the FIRROE after tax of 23.50% is considered to be feasible in terms of return on equity.

(3) Financial Ratios and Profit Break Even Point (B.E.P.) Analysis

To analyze and evaluate financial stability and break-even point of the project, three parameters in Table 8 are used, the DSCR, the debt equity ratio, and the profit BEP.

Table 10.4.1 Financial Ratios and Profit B.E.P.

Year	DSCR	Debt Equity Ratio	Profit B.E.P. Capacity Utilization (%)
2007	1.42	63 / 37	72.0
2008	1.83	54 / 46	66.4
2009	2.06	46 / 54	63.3
2010	2.19	38 / 62	60.6
2011	2.33	29 / 71	58.1
2012	2.29	21 / 79	44.4
2013	2.46	13 / 87	41.9
2014	2.65	6 / 94	39.4
2015	2.86	0 / 100	37.0
2016	3.12	0 / 100	34.5
2017	* * * * *	0 / 100	12.4
.....
2021	* * * * *	0 / 100	12.4

The DSCR is a major indicator to measure a general risk for long-term debtors. If it falls below 1.0, additional funding is required for repayment of long-term debts together with interest. As shown in the table, the DSCR for the project is maintained above 1.0 from the first year, indicating that the project creates sound cash flow to allow for repayment of long-term debt without reducing internal reserves.

Similarly, the debt equity ratio is another measure of the project's financial viability for long-term debtors by looking at the ratio of outstanding long-term debts to stockholders' equity (share capital plus retained earnings), e.g., 70:30. As the ratio of the share capital exceeds 50, long-term debts are fully covered by the project's internal reserves. The debt service ratio for the project

exceeds the safety benchmark in the third year (2009) when the ratio of the share capital reaches 54, indicating financial soundness.

Finally, the break-even point analysis measures project profitability by comparing the project's total sales revenue and the total production cost. In this analysis, an attempt is made to determine a capacity utilization rate at which the total sales revenue becomes equal to the total production cost. The break-even point in the first year, as measured by the capacity utilization rate, is 72.0%, which is slightly below the planned utilization rate of 80%. This means, if the capacity utilization rate declines 8.0%, the production cost will exceed the total sales revenue. However, the break-even point will decline rapidly, less than 70% in the second year (2008) and 60% in 2011.

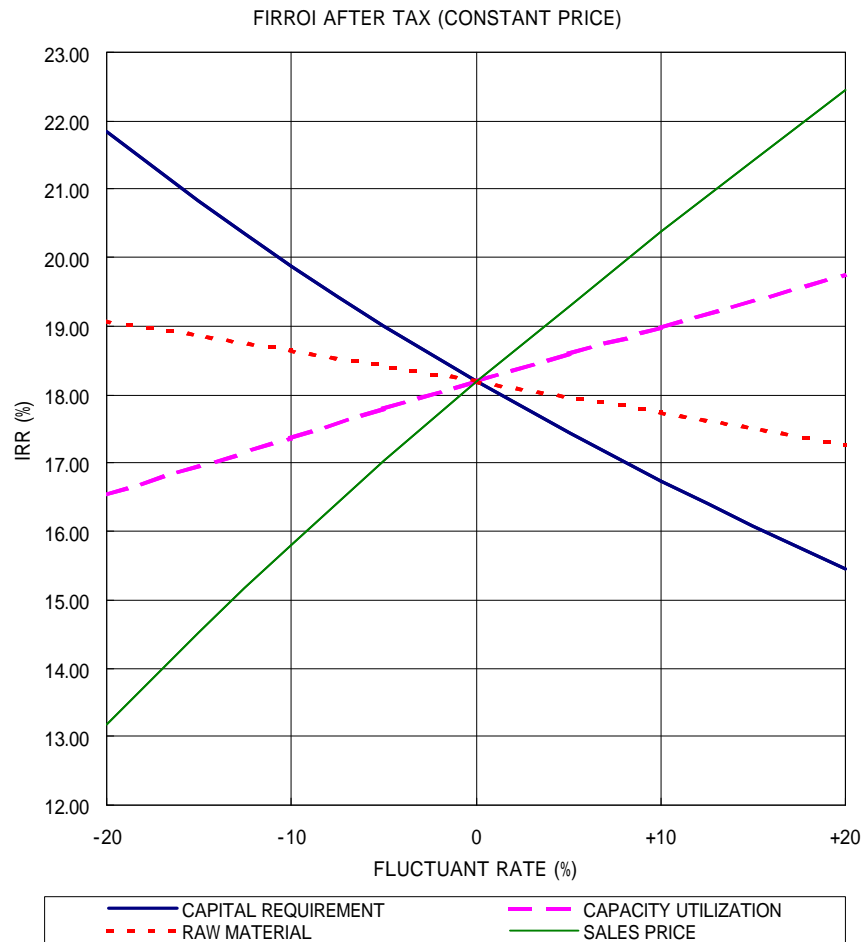
10.5 Sensitive Analysis

Sensitivity analysis determines the possible changes in the internal rates of return due to variations of major financial parameters. The following table shows financial impacts of variations of five parameters on the FIRROI and FIRROE, both in constant price.

Table 10.5.1 Tale of Sensibility Analysis

Case	UNIT	Modified Figure		FIRR Bfr Tax	FIRR Aft Tax	FIRROE(Aft.Tx)	SENSITIVITY INDICATOR		
				(%)	(%)	(%)	FIRR-B-T	FIRR-A-T	FIRROE
Base Case				19.02	18.19	23.50	Change in IRR per one percent of Deviation		
Capital Requirement	1000US\$								
	+	20%	1026810	16.27	15.44	18.40	-0.14	-0.14	-0.26
	+	10%	941243	17.56	16.73	20.80	-0.15	-0.15	-0.27
Base Case	0%		855675	19.02	18.19	23.50	0	0	0
	-	10%	770108	20.7	19.87	26.59	0.17	0.17	0.31
	-	20%	684540	22.66	21.84	30.14	0.18	0.18	0.33
Pulpwood Price	US\$/m3ub		Soft Wood	Hard Wood					
	+	20%	31.96	24.43	18.11	17.27	-0.05	-0.05	-0.09
	+	10%	29.29	22.40	18.57	17.73	-0.04	-0.05	-0.09
Base Case	0%		24.58	18.45	19.02	18.19	23.50	0	0
	-	10%	23.97	18.32	19.47	18.64	24.35	0.04	0.04
	-	20%	21.3	16.29	19.91	19.08	25.91	0.04	0.12
Labor Cost	1000US\$								
	+	50%	6078	18.78	17.95	23.05	-0.00	-0.00	-0.01
	+	30%	5268	18.88	18.04	23.23	-0.00	-0.01	-0.01
	+	10%	4457	18.97	18.14	23.41	-0.01	-0.01	-0.01
Base Case	0%		4052	19.02	18.19	23.50	0	0	0
Operational Rate	%								
	-	50%	40-47.5-50%	8.33	7.72	4.19	-0.21	-0.21	-0.39
	-	30%	56-66.5-70%	13.23	12.42	12.75	-0.19	-0.19	-0.36
	-	10%	72-85.5-90%	17.25	16.42	20.21	-0.18	-0.18	-0.33
Base Case	0%		80-95-100%	19.02	18.19	23.50	0	0	0
Product Price	US\$/MT		BSKP	BHKP					
	-	50%	320.00	307.50	3.50	3.50	-2.47	-0.31	-0.52
	-	30%	448.00	430.50	11.04	10.29	8.85	-0.27	-0.26
	-	10%	576.00	553.50	16.63	15.80	19.05	-0.24	-0.24
Base Case	0%		640.00	615.00	19.02	18.19	23.50	0	0
	+	10%	704.00	676.50	21.22	20.39	27.59	0.22	0.22
	+	30%	832.00	799.50	25.17	24.37	34.83	0.21	0.21
	+	50%	960.00	922.50	28.67	27.91	41.10	0.19	0.19

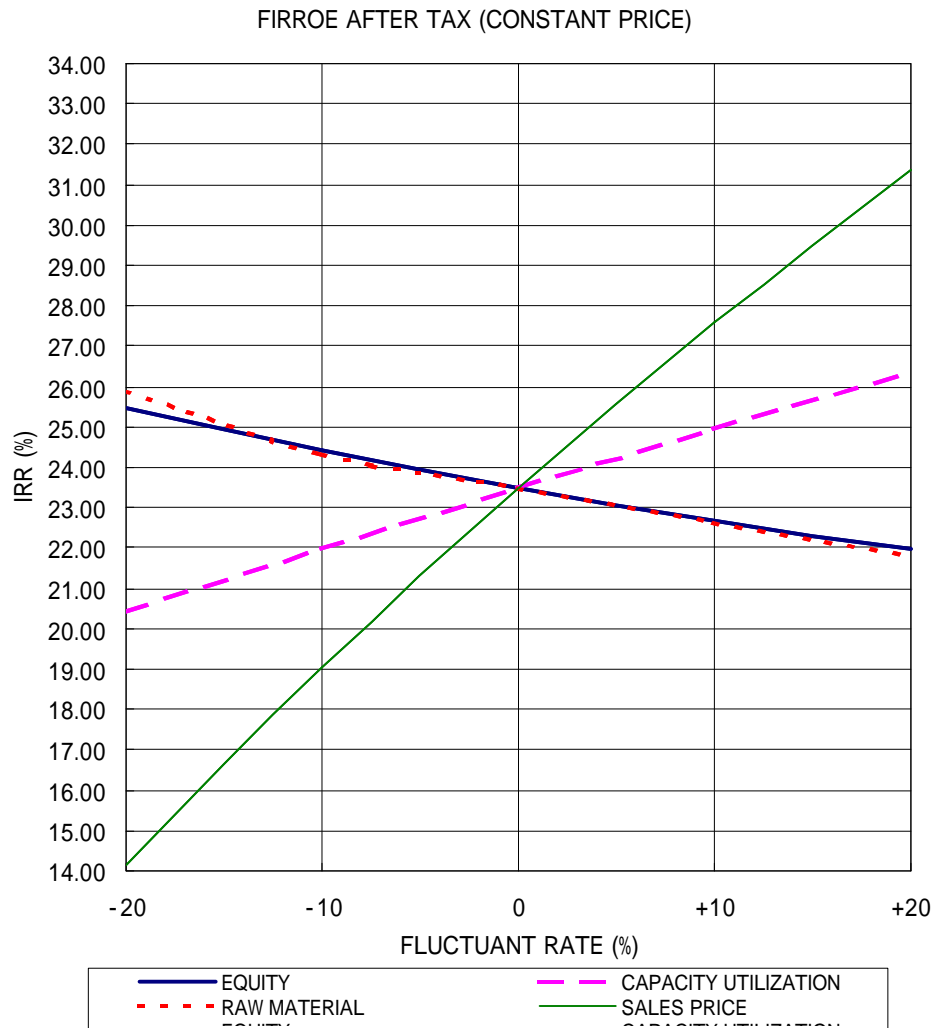
(1) FIRROI



As shown in the figure, variation of the raw material cost has the least impact, i.e., the FIRROI after tax changes less than $\pm 1\%$ so far as the raw material cost varies within $\pm 20\%$. The sales price has the largest impact, while the capital requirement and the capacity utilization rate cause more or less the same and intermediate levels of change in the FIRROI; a 10% decline in sales price results in a decline of the FIRROI by .2.39 percentage points compared to the base value, while a 10 % decline in capacity utilization rate a 1.77% decline and a 10% increase in capital requirement a 1.46% decline.

Naturally, a combination of two parameters increases the impact. For instance, if the construction cost increases 10% above the estimated level and the sales price falls 10%, the FIRROI after tax will drop 2.39 percentage points to 15.80% (the FIRROI before tax 16.63%).

(2) FIRROE



As for the FIRROE, the sales price has the largest impact, followed by the capacity utilization rate. On the other hand, equity capital and the raw material cost have fairly small impacts. For instance, a 10% decline in sales price causes the FIRROE after tax to fall 4.45 percentage points, and a 10% decline in capacity utilization rate results in a 3.29% decline in FIRROE. A 10% increase in equity capital brings the FIRROE down by 2.70% and a 10% raw material cost 0.46%.

Again, a combination of two parameters will intensify the impacts. For instance, a 10% increase in equity capital and a 10% decline in sales price result in the FIRROE after tax of 18.47%, down 5.03% from the base value.

10.6 Overall Evaluation of Financial Feasibility

The results of the financial analysis are summarized as follows.

Table 10.6.1 Overall Evaluation of Financial Feasibility

Results of Financial Analysis					Evaluation		
Profitability	FIRROI		Before Tax	19.02%		Feasible	
			After Tax	18.19%		Feasible	
	FIRROE		Before Tax	24.71%		Feasible	
			After Tax	23.50%		Feasible	
Financial Ratios	DSCR		Year	DSCR		Acceptable	
			2007	1.42	> 1.0		
			2008	1.83			
			2011	2.33			
			2013	2.46			
	Dept Equity Ratio		Year	Equity		Acceptable	
			2009	54	> 50		
			2010	62			
			2012	79			
			2014	94			
			2015 ~	100			
Profit B.E. P.	Year	B.E.P.	Planned Capacity Utilization		Acceptable		
	2007	72.0% <	80%				
	2008	66.4% <	95%				
	2009	63.3% <	100%				
	2016	34.5% <	100%				
	2017 ~	12.4% <	100%				
Sensitivity Analysis	Variation			- 20%	- 10%	+	+
	Selling Price (The most sensitive factor)	FIRROI (%)	Before tax	13.18	15.80	20.39	22.44
			After tax	14.00	16.63	21.22	23.26
		Base value (%)	Before tax	19.02			
			After tax	18.19			
		FIRROE (%)	Before tax	14.16	19.05	27.59	31.34
			After tax	15.58	20.36	28.68	32.35
		Base value (%)	Before tax	24.71			
			After tax	23.50			

10.7 Conclusion

In conclusion, the project is financially feasible and its financial base is expected to be sound over the project life, for the following reasons.

(1) Profitability

- a. The project shows good profitability for the base case analysis and is therefore financially feasible.
- b. The FIRROI, which serves as the indicator of dividend propensity to shared capital, indicates that the project will be able to distribute the 20% dividend from the second year.
- c. The break-even point measured by the operating rate is 72.0% in the first year, below the planned operating rate, to indicate sound profitability.
- d. The result of sensitivity analysis indicates that the project's profitability is most sensitive to the produce price. Market prices have increased over the average price in the second quarter of 2000 and are expected to rise for the time being.

The capacity utilization rate is the second important sensitivity factor. Again, BKP demand grows steadily and is expected to work favorable for the capacity utilization rate, which is thus not likely to fall for market reasons.

Similarly, the rise in construction cost is not conceivable because pulp mill investment levels off worldwide and paper machine manufacturers do not have enough backlogs.

(2) Financial stability

- a. The debt service coverage ratio (DSCR) to measure the project's loan repayment capability is fairly high at 1.42 in the first year and will increase to 1.83, 2.06 and 2.19 in the subsequent years, indicating that the project will be able to pay back its debt quickly.

- b. The cash flow prediction negates the need for short-term loans. This study sets a conservative assumption that the 20% dividend will start in the third year. With the dividend, the surplus will grow steadily to improve the project's financial base. The marginal product price to represent the project's break-even point is USD516.5/ton in the first year, which will fall below USD400 in the fourth year and thereafter. Compared to the current world market prices and future projections, the project will be able to operate far above the break-even point.
- c. The liquidity ratio will increase year after year despite the 20% dividend that is assumed to start in the third year.

APPENDIX 10

FINANCIAL STATEMENTS (BASE CASE)

Table 1	PRODUCTION AND SALES PLAN
Table 2	PRODUCTION COST STATEMENTS
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Table 9-2	FINANCIAL RATE OF RETURN ON EQUITY (IN CONSTANT PRICE)

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JOB START

BASE CASE

Table 1

*** PULP PLANT IN LITHUANIA ***
 PRODUCTION AND SALES PLAN
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 1

YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
RATED CAPACITY (TOTAL)	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.
UTILIZATION OF SALES SHOP	0.0	0.0	0.0	0.0	0.800	0.950	1.000	1.000	1.000	1.000
PRODUCTION VOLUME	0.	0.	0.	0.	400000.	475000.	500000.	500000.	500000.	500000.
INCREASE IN INVENTORY	0.	0.	0.	0.	16667.	3125.	1042.	0.	0.	0.
SALES IN VOLUME	0.	0.	0.	0.	383333.	471875.	498958.	500000.	500000.	500000.
RATED CAPACITY (BSKP)	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.
UTILIZATION OF SALES SHOP	0.0	0.0	0.0	0.0	0.800	0.950	1.000	1.000	1.000	1.000
PRODUCTION VOLUME	0.	0.	0.	0.	203406.	241544.	254257.	254257.	254257.	254257.
INCREASE IN INVENTORY	0.	0.	0.	0.	8475.	1589.	530.	0.	0.	0.
SALES IN VOLUME	0.	0.	0.	0.	194930.	239955.	253727.	254257.	254257.	254257.
UNIT SALES PRICE	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400
SALES REVENUE	0.	0.	0.	0.	124755.	153571.	162385.	162724.	162724.	162724.
RATED CAPACITY (BHKP)	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.
UTILIZATION OF SALES SHOP	0.0	0.0	0.0	0.0	0.800	0.950	1.000	1.000	1.000	1.000
PRODUCTION VOLUME	0.	0.	0.	0.	196594.	233456.	245743.	245743.	245743.	245743.
INCREASE IN INVENTORY	0.	0.	0.	0.	8191.	1536.	512.	0.	0.	0.
SALES IN VOLUME	0.	0.	0.	0.	188403.	231920.	245231.	245743.	245743.	245743.
UNIT SALES PRICE	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150
SALES REVENUE	0.	0.	0.	0.	115868.	142631.	150817.	151132.	151132.	151132.
TOTAL SALES REVENUE	0.	0.	0.	0.	240623.	296202.	313203.	313856.	313856.	313856.
OTHER OPERATING INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NON-OPERATING INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

*** PULP PLANT IN LITHUANIA ***
 PRODUCTION AND SALES PLAN
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 2

YEAR	2013	2014	2015	2016	2017	2018	2019	2020	2021
RATED CAPACITY (TOTAL)	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.
UTILIZATION OF SALES SHOP	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION VOLUME	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.
SALES IN VOLUME	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.
RATED CAPACITY (BSKP)	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.
UTILIZATION OF SALES SHOP	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION VOLUME	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.
SALES IN VOLUME	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.	254257.
UNIT SALES PRICE	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400	0.6400
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SALES REVENUE	162724.	162724.	162724.	162724.	162724.	162724.	162724.	162724.	162724.
RATED CAPACITY (BHKP)	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.
UTILIZATION OF SALES SHOP	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
PRODUCTION VOLUME	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.
INCREASE IN INVENTORY	0.	0.	0.	0.	0.	0.	0.	0.	0.
SALES IN VOLUME	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.	245743.
UNIT SALES PRICE	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150	0.6150
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SALES REVENUE	151132.	151132.	151132.	151132.	151132.	151132.	151132.	151132.	151132.
TOTAL SALES REVENUE	313856.	313856.	313856.	313856.	313856.	313856.	313856.	313856.	313856.
OTHER OPERATING INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.
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NON-OPERATING INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.
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Table 2

*** PULP PLANT IN LITHUANIA ***
 PRODUCTION COST STATEMENTS
 BASE CASE - S/H: 55/45(AVERAGE) - (USD 1000)

PAGE 1

YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
PRODUCTION VOLUME	0.	0.	0.	0.	400000.	475000.	500000.	500000.	500000.	500000.
RAW MATERIAL COST	0.	0.	0.	0.	46647.	55394.	58309.	58309.	58309.	58309.
SOFT WOOD FOR BSKP	0.	0.	0.	0.	28695.	34076.	35869.	35869.	35869.	35869.
SOFT WOOD FOR BHKP	0.	0.	0.	0.	17952.	21318.	22440.	22440.	22440.	22440.
UTILITY COST	0.	0.	0.	0.	2624.	3116.	3280.	3280.	3280.	3280.
ELECTRIC POWER	0.	0.	0.	0.	286.	340.	358.	358.	358.	358.
RAW WATER	0.	0.	0.	0.	600.	713.	750.	750.	750.	750.
NATURAL GAS	0.	0.	0.	0.	1738.	2064.	2172.	2172.	2172.	2172.
SUPPLIES	0.	0.	0.	0.	8512.	10108.	10640.	10640.	10640.	10640.
CHEMICALS	0.	0.	0.	0.	7512.	8920.	9390.	9390.	9390.	9390.
PACKING	0.	0.	0.	0.	1000.	1187.	1250.	1250.	1250.	1250.
VARIABLE COST	0.	0.	0.	0.	57783.	68618.	72229.	72229.	72229.	72229.
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EMPLOYMENT COST	0.	0.	0.	0.	6078.	6078.	6078.	6078.	6078.	6078.
LABOUR COST	0.	0.	0.	0.	4052.	4052.	4052.	4052.	4052.	4052.
FACTORY OVERHEAD	0.	0.	0.	0.	2026.	2026.	2026.	2026.	2026.	2026.
MAINTENANCE COST	0.	0.	0.	0.	8575.	8575.	8575.	8575.	8575.	8575.
TAX AND INSURANCE	0.	0.	0.	0.	4038.	4038.	4038.	4038.	4038.	4038.
OPERATION ADVISORS	0.	0.	0.	0.	802.	802.	0.	0.	0.	0.
FACTORY FIXED COST	0.	0.	0.	0.	19493.	19493.	18691.	18691.	18691.	18691.
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CASH FACTORY COST	0.	0.	0.	0.	77276.	88111.	90920.	90920.	90920.	90920.
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PROCESS PLANT	0.	0.	0.	0.	48796.	48796.	48796.	48796.	48796.	48796.
UTILITIES AND OFFSITE	0.	0.	0.	0.	813.	813.	813.	813.	813.	813.
BUILDINGS	0.	0.	0.	0.	7398.	7398.	7398.	7398.	7398.	7398.
PRE-OPERATING EXPENSES	0.	0.	0.	0.	3438.	3438.	3438.	3438.	3438.	0.
INTEREST DURING CONSTRUCTION	0.	0.	0.	0.	23787.	23787.	23787.	23787.	23787.	0.
DEPRECIATION AND AMORTIZATION	0.	0.	0.	0.	84231.	84231.	84231.	84231.	84231.	57007.
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TOTAL FACTORY COST	0.	0.	0.	0.	161507.	172342.	175151.	175151.	175151.	147927.
UNIT FACTORY COST	0.0	0.0	0.0	0.0	0.4038	0.3628	0.3503	0.3503	0.3503	0.2959
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SALES EXPENSES	0.	0.	0.	0.	2406.	2962.	3132.	3139.	3139.	3139.
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INTEREST ON LONG TERM DEBT	0.	0.	0.	0.	58400.	52410.	46420.	40431.	34441.	28451.
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INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
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TOTAL PRODUCTION COST	0.	0.	0.	0.	222313.	227714.	224704.	218720.	212731.	179516.
UNIT PRODUCTION COST	0.0	0.0	0.0	0.0	0.5558	0.4794	0.4494	0.4374	0.4255	0.3590

*** PULP PLANT IN LITHUANIA ***
 PRODUCTION COST STATEMENTS
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 2

YEAR	2013	2014	2015	2016	2017	2018	2019	2020	2021
PRODUCTION VOLUME	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.	500000.
RAW MATERIAL COST	58309.	58309.	58309.	58309.	58309.	58309.	58309.	58309.	58309.
SOFT WOOD FOR BSKP	35869.	35869.	35869.	35869.	35869.	35869.	35869.	35869.	35869.
SOFT WOOD FOR BHKP	22440.	22440.	22440.	22440.	22440.	22440.	22440.	22440.	22440.
UTILITY COST	3280.	3280.	3280.	3280.	3280.	3280.	3280.	3280.	3280.
ELECTRIC POWER	358.	358.	358.	358.	358.	358.	358.	358.	358.
RAW WATER	750.	750.	750.	750.	750.	750.	750.	750.	750.
NATURAL GAS	2172.	2172.	2172.	2172.	2172.	2172.	2172.	2172.	2172.
SUPPLIES	10640.	10640.	10640.	10640.	10640.	10640.	10640.	10640.	10640.
CHEMICALS	9390.	9390.	9390.	9390.	9390.	9390.	9390.	9390.	9390.
PACKING	1250.	1250.	1250.	1250.	1250.	1250.	1250.	1250.	1250.
VARIABLE COST	72229.	72229.	72229.	72229.	72229.	72229.	72229.	72229.	72229.
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EMPLOYMENT COST	6078.	6078.	6078.	6078.	6078.	6078.	6078.	6078.	6078.
LABOUR COST	4052.	4052.	4052.	4052.	4052.	4052.	4052.	4052.	4052.
FACTORY OVERHEAD	2026.	2026.	2026.	2026.	2026.	2026.	2026.	2026.	2026.
MAINTENANCE COST	8575.	8575.	8575.	8575.	8575.	8575.	8575.	8575.	8575.
TAX AND INSURANCE	4038.	4038.	4038.	4038.	4038.	4038.	4038.	4038.	4038.
OPERATION ADVISORS	0.	0.	0.	0.	0.	0.	0.	0.	0.
FACTORY FIXED COST	18691.	18691.	18691.	18691.	18691.	18691.	18691.	18691.	18691.
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CASH FACTORY COST	90920.	90920.	90920.	90920.	90920.	90920.	90920.	90920.	90920.
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PROCESS PLANT	48796.	48796.	48796.	48796.	0.	0.	0.	0.	0.
UTILITIES AND OFFSITE	813.	813.	813.	813.	813.	813.	813.	813.	813.
BUILDINGS	7398.	7398.	7398.	7398.	7398.	7398.	7398.	7398.	7398.
PRE-OPERATING EXPENSES	0.	0.	0.	0.	0.	0.	0.	0.	0.
INTEREST DURING CONSTRUCTION	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEPRECIATION AND AMORTIZATION	57007.	57007.	57007.	57007.	8210.	8210.	8210.	8210.	8210.
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TOTAL FACTORY COST	147927.	147927.	147927.	147927.	99130.	99130.	99130.	99130.	99130.
UNIT FACTORY COST	0.2959	0.2959	0.2959	0.2959	0.1983	0.1983	0.1983	0.1983	0.1983
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SALES EXPENSES	3139.	3139.	3139.	3139.	3139.	3139.	3139.	3139.	3139.
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INTEREST ON LONG TERM DEBT	22461.	16472.	10482.	4492.	0.	0.	0.	0.	0.
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INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.
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TOTAL PRODUCTION COST	173527.	167537.	161547.	155558.	102269.	102269.	102269.	102269.	102269.
UNIT PRODUCTION COST	0.3471	0.3351	0.3231	0.3111	0.2045	0.2045	0.2045	0.2045	0.2045

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Table 3

*** PULP PLANT IN LITHUANIA ***
 WORKING CAPITAL STATEMENTS
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 1

YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
CURRENT ASSETS	2783.	5566.	8349.	19616.	54428.	60944.	62712.	62766.	62766.	61632.
ACCOUNT RECEIVABLE	0.	0.	0.	0.	20052.	24683.	26100.	26155.	26155.	26155.
INVENTORIES	2783.	5566.	8349.	19616.	27936.	28918.	29035.	29035.	29035.	27901.
PRODUCT INVENTORY	0.	0.	0.	0.	6730.	7181.	7298.	7298.	7298.	6164.
MATERIAL INVENTORY	0.	0.	0.	8484.	10075.	10605.	10605.	10605.	10605.	10605.
RAW MATERIAL	0.	0.	0.	7775.	9232.	9718.	9718.	9718.	9718.	9718.
SUPPLIES	0.	0.	0.	709.	842.	887.	887.	887.	887.	887.
SPARE PARTS	2783.	5566.	8349.	11132.	11132.	11132.	11132.	11132.	11132.	11132.
CASH IN HAND	0.	0.	0.	0.	6440.	7343.	7577.	7577.	7577.	7577.
CURRENT LIABILITIES W/O DEBT	0.	0.	0.	0.	4815.	5718.	6019.	6019.	6019.	6019.
ACCOUNT PAYABLE	0.	0.	0.	0.	4815.	5718.	6019.	6019.	6019.	6019.
PERMANENT WORKING CAPITAL	2783.	5566.	8349.	19616.	49612.	55226.	56693.	56747.	56747.	55613.
CHANGE IN WORKING CAPITAL	2783.	2783.	2783.	11267.	29997.	5613.	1467.	54.	0.	-1134.

*** PULP PLANT IN LITHUANIA ***
 WORKING CAPITAL STATEMENTS
 BASE CASE - S/H: 55/45(AVERAGE) - (USD 1000)

PAGE 2

YEAR	2013	2014	2015	2016	2017	2018	2019	2020	2021
CURRENT ASSETS	61632.	61632.	61632.	61632.	59599.	59599.	59599.	59599.	59599.
ACCOUNT RECEIVABLE	26155.	26155.	26155.	26155.	26155.	26155.	26155.	26155.	26155.
INVENTORIES	27901.	27901.	27901.	27901.	25867.	25867.	25867.	25867.	25867.
PRODUCT INVENTORY	6164.	6164.	6164.	6164.	4130.	4130.	4130.	4130.	4130.
MATERIAL INVENTORY	10605.	10605.	10605.	10605.	10605.	10605.	10605.	10605.	10605.
RAW MATERIAL	9718.	9718.	9718.	9718.	9718.	9718.	9718.	9718.	9718.
SUPPLIES	887.	887.	887.	887.	887.	887.	887.	887.	887.
SPARE PARTS	11132.	11132.	11132.	11132.	11132.	11132.	11132.	11132.	11132.
CASH IN HAND	7577.	7577.	7577.	7577.	7577.	7577.	7577.	7577.	7577.
CURRENT LIABILITIES W/O DEBT	6019.	6019.	6019.	6019.	6019.	6019.	6019.	6019.	6019.
ACCOUNT PAYABLE	6019.	6019.	6019.	6019.	6019.	6019.	6019.	6019.	6019.
PERMANENT WORKING CAPITAL	55613.	55613.	55613.	55613.	53579.	53579.	53579.	53579.	53579.
CHANGE IN WORKING CAPITAL	0.	0.	0.	0.	-2033.	0.	0.	0.	0.

Table 4

*** PULP PLANT IN LITHUANIA ***
 INCOME STATEMENTS (FOR ENDING DECEMBER 31)
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 1

YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
OPERATING INCOME	0.	0.	0.	0.	240623.	296202.	313203.	313856.	313856.	313856.
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TOTAL SALES REVENUE	0.	0.	0.	0.	240623.	296202.	313203.	313856.	313856.	313856.
OTHER OPERATING INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
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COST OF SALES	0.	0.	0.	0.	154778.	171890.	175034.	175151.	175151.	149061.
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VARIABLE COST	0.	0.	0.	0.	57783.	68618.	72229.	72229.	72229.	72229.
FACTORY FIXED COST	0.	0.	0.	0.	19493.	19493.	18691.	18691.	18691.	18691.
DEPRECIATION AND AMORTIZATION	0.	0.	0.	0.	84231.	84231.	84231.	84231.	84231.	57007.
INC. IN PRODUCT INVENTORY	0.	0.	0.	0.	6730.	451.	117.	0.	0.	-1134.
GROSS PROFIT ON SALES	0.	0.	0.	0.	85845.	124312.	138168.	138705.	138705.	164795.
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SALES EXPENSES	0.	0.	0.	0.	2406.	2962.	3132.	3139.	3139.	3139.
OPERATING PROFIT	0.	0.	0.	0.	83439.	121350.	135036.	135567.	135567.	161657.
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NON-OPERATING INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
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NON-OPERATING EXPENSES	0.	0.	0.	0.	58400.	52410.	46420.	40431.	34441.	28451.
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INTEREST ON LONG TERM DEBT	0.	0.	0.	0.	58400.	52410.	46420.	40431.	34441.	28451.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NET PROFIT OR (LOSS) BEFORE TAX	0.	-0.	-0.	-0.	25039.	68939.	88616.	95136.	101126.	133206.
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INCOME TAX	0.	0.	0.	0.	0.	0.	0.	0.	0.	15985.
NET PROFIT OR (LOSS) AFTER TAX	0.	-0.	-0.	-0.	25039.	68939.	88616.	95136.	101126.	117221.
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DIVIDENDS	0.	0.	0.	0.	0.	0.	17723.	19027.	20225.	23444.
RETAINED EARNINGS	0.	-0.	-0.	-0.	25039.	68939.	70893.	76109.	80901.	93777.
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*** PULP PLANT IN LITHUANIA ***
 INCOME STATEMENTS (FOR ENDING DECEMBER 31)
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 2

YEAR	2013	2014	2015	2016	2017	2018	2019	2020	2021
OPERATING INCOME	313856.	313856.	313856.	313856.	313856.	313856.	313856.	313856.	313856.
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TOTAL SALES REVENUE	313856.	313856.	313856.	313856.	313856.	313856.	313856.	313856.	313856.
OTHER OPERATING INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.
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COST OF SALES	147927.	147927.	147927.	147927.	101164.	99130.	99130.	99130.	99130.
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VARIABLE COST	72229.	72229.	72229.	72229.	72229.	72229.	72229.	72229.	72229.
FACTORY FIXED COST	18691.	18691.	18691.	18691.	18691.	18691.	18691.	18691.	18691.
DEPRECIATION AND AMORTIZATION	57007.	57007.	57007.	57007.	8210.	8210.	8210.	8210.	8210.
INC. IN PRODUCT INVENTORY	0.	0.	0.	0.	-2033.	0.	0.	0.	0.
GROSS PROFIT ON SALES	165930.	165930.	165930.	165930.	212693.	214726.	214726.	214726.	214726.
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SALES EXPENSES	3139.	3139.	3139.	3139.	3139.	3139.	3139.	3139.	3139.
OPERATING PROFIT	162791.	162791.	162791.	162791.	209554.	211587.	211587.	211587.	211587.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NON-OPERATING INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NON-OPERATING EXPENSES	22461.	16472.	10482.	4492.	0.	0.	0.	0.	0.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
INTEREST ON LONG TERM DEBT	22461.	16472.	10482.	4492.	0.	0.	0.	0.	0.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.
NET PROFIT OR (LOSS) BEFORE TAX	140330.	146319.	152309.	158299.	209554.	211587.	211587.	211587.	211587.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
INCOME TAX	16840.	17558.	18277.	18996.	50293.	50781.	50781.	50781.	50781.
NET PROFIT OR (LOSS) AFTER TAX	123490.	128761.	134032.	139303.	159261.	160806.	160806.	160806.	160806.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
DIVIDENDS	24698.	25752.	26806.	27861.	31852.	32161.	32161.	32161.	32161.
RETAINED EARNINGS	98792.	103009.	107226.	111442.	127409.	128645.	128645.	128645.	128645.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Table 5

*** PULP PLANT IN LITHUANIA ***
 FUNDS FLOW STATEMENTS (FOR ENDING DECEMBER 31)
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 1

YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
SOURCE OF FUNDS	197268.	261198.	275521.	121690.	167670.	205581.	219267.	219798.	219798.	202679.
CASH GENERATED FROM OPERATION	0.	0.	0.	0.	167670.	205581.	219267.	219798.	219798.	202679.
PROFIT AFT. TAX, BFR INT. DEPRECIATION AND AMORTIZATION	0.	0.	0.	0.	83439.	121350.	135036.	135567.	135567.	145672.
FINANCIAL RESOURCES	197268.	261198.	275521.	121690.	84231.	84231.	84231.	84231.	84231.	57007.
SHARE CAPITAL	67307.	92861.	83560.	12975.	0.	0.	0.	0.	0.	0.
LONG TERM DEBT	129961.	168336.	191960.	108716.	0.	0.	0.	0.	0.	0.
SHORT TERM DEBT	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.
USES OF FUNDS	197268.	261198.	275521.	102755.	148294.	117921.	125508.	119410.	114563.	110658.
FIXED CAPITAL EXPENDITURE	194485.	258415.	272737.	91486.	0.	0.	0.	0.	0.	0.
NON-DEPRECIABLE ASSETS	14416.	14416.	0.	0.	0.	0.	0.	0.	0.	0.
DEPRECIABLE FIXED ASSETS	176820.	222472.	232556.	37509.	0.	0.	0.	0.	0.	0.
INTEREST DURING CONSTRUCTION	3249.	21527.	40181.	53977.	0.	0.	0.	0.	0.	0.
CHANGE IN WORKING CAPITAL	2783.	2783.	2783.	11267.	29997.	5613.	1467.	54.	0.	-1134.
DEBT SERVICES	0.	0.	1.	1.	118297.	112307.	106318.	100328.	94338.	88348.
REPAYMENT OF LONG TERM DEBT	0.	0.	0.	0.	59897.	59897.	59897.	59897.	59897.	59897.
REPAYMENT OF SHORT TERM DEBT	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
INTEREST ON LONG TERM DEBT	0.	0.	0.	0.	58400.	52410.	46420.	40431.	34441.	28451.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DIVIDENDS	0.	0.	0.	0.	0.	0.	17723.	19027.	20225.	23444.
CASH INCREASE OR (DECREASE)	0.	0.	0.	18936.	19377.	87660.	93760.	100388.	105234.	92020.
BEGINNING CASH BALANCE	0.	0.	0.	0.	18936.	38312.	125973.	219732.	320120.	425355.
ENDING CASH BALANCE	0.	0.	0.	18936.	38312.	125973.	219732.	320120.	425355.	517375.

A10-12

*** PULP PLANT IN LITHUANIA ***
FUNDS FLOW STATEMENTS (FOR ENDING DECEMBER 31)
BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 2

YEAR	2013	2014	2015	2016	2017	2018	2019	2020	2021
SOURCE OF FUNDS	202958.	202239.	201521.	200802.	167472.	169017.	169017.	169017.	169017.
CASH GENERATED FROM OPERATION	202958.	202239.	201521.	200802.	167472.	169017.	169017.	169017.	169017.
PROFIT AFT. TAX, BFR INT. DEPRECIATION AND AMORTIZATION	145952. 57007.	145233. 57007.	144514. 57007.	143795. 57007.	159261. 8210.	160806. 8210.	160806. 8210.	160806. 8210.	160806. 8210.
FINANCIAL RESOURCES	0.	0.	0.	0.	0.	0.	0.	0.	0.
SHARE CAPITAL	0.	0.	0.	0.	0.	0.	0.	0.	0.
LONG TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.
SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.
USES OF FUNDS	107057.	102121.	97186.	92250.	29819.	32161.	32161.	32161.	32161.
FIXED CAPITAL EXPENDITURE	0.	0.	0.	0.	0.	0.	0.	0.	0.
NON-DEPRECIABLE ASSETS	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEPRECIABLE FIXED ASSETS	0.	0.	0.	0.	0.	0.	0.	0.	0.
INTEREST DURING CONSTRUCTION	0.	0.	0.	0.	0.	0.	0.	0.	0.
CHANGE IN WORKING CAPITAL	0.	0.	0.	0.	-2033.	0.	0.	0.	0.
DEBT SERVICES	82359.	76369.	70379.	64390.	0.	0.	0.	0.	0.
REPAYMENT OF LONG TERM DEBT	59897.	59897.	59897.	59897.	0.	0.	0.	0.	0.
REPAYMENT OF SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.
INTEREST ON LONG TERM DEBT	22461.	16472.	10482.	4492.	0.	0.	0.	0.	0.
INTEREST ON SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.
DIVIDENDS	24698.	25752.	26806.	27861.	31852.	32161.	32161.	32161.	32161.
CASH INCREASE OR (DECREASE)	95901.	100118.	104335.	108552.	137652.	136855.	136855.	136855.	136855.
BEGINNING CASH BALANCE	517375.	613277.	713395.	817730.	926281.	1063934.	1200789.	1337645.	1474500.
ENDING CASH BALANCE	613277.	713395.	817730.	926281.	1063934.	1200789.	1337645.	1474500.	1611356.

Table 6

*** PULP PLANT IN LITHUANIA ***
 BALANCE SHEET (FOR ENDING DECEMBER 31)
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 1

YEAR	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
ASSETS	197268.	458465.	733986.	855675.	825632.	835577.	846873.	863085.	884088.	917968.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
CURRENT ASSETS	2783.	5566.	8349.	19616.	54428.	60944.	62712.	62766.	62766.	61632.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
CASH IN HAND	0.	0.	0.	0.	6440.	7343.	7577.	7577.	7577.	7577.
ACCOUNT RECEIVABLE	0.	0.	0.	0.	20052.	24683.	26100.	26155.	26155.	26155.
INVENTORIES	2783.	5566.	8349.	19616.	27936.	28918.	29035.	29035.	29035.	27901.
ACC. EXCESS CASH	0.	0.	0.	18936.	38312.	125973.	219732.	320120.	425355.	517375.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
NET FIXED ASSETS	194485.	452899.	725637.	817123.	732892.	648661.	564430.	480198.	395967.	338961.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
INVESTMENT	194485.	452899.	725637.	817123.	817123.	817123.	817123.	817123.	817123.	817123.
NON-DEPR. ASSETS	14416.	28831.	28831.	28831.	28831.	28831.	28831.	28831.	28831.	28831.
DEPRECIABLE ASSETS	176820.	399292.	631848.	669357.	669357.	669357.	669357.	669357.	669357.	669357.
AMORTIZATION	3249.	24777.	64958.	118935.	118935.	118935.	118935.	118935.	118935.	118935.
LESS: ACC. DEPRECIATION	0.	0.	0.	0.	84231.	168462.	252693.	336925.	421156.	478162.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
LIABILITIES	129961.	298297.	490258.	598973.	543891.	484896.	425300.	365403.	305505.	245608.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
CURRENT LIABILITIES	0.	1.	1.	59897.	64713.	65615.	65916.	65916.	65916.	65916.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ACCOUNT PAYABLE	0.	0.	0.	0.	4815.	5718.	6019.	6019.	6019.	6019.
CURRENT PORTION OF L/T DEBT	0.	0.	0.	59897.	59897.	59897.	59897.	59897.	59897.	59897.
SHORT TERM DEBT	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
FIXED LIABILITIES	129961.	298297.	490257.	539075.	479178.	419281.	359384.	299486.	239589.	179692.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
LONG TERM DEBT BALANCE	129961.	298297.	490257.	539075.	479178.	419281.	359384.	299486.	239589.	179692.
OTHER FIXED LIABILITIES	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
STOCK HOLDERS EQUITY	67307.	160168.	243728.	256702.	281741.	350681.	421574.	497682.	578583.	672360.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
SHARE CAPITAL	67307.	160168.	243728.	256703.	256703.	256703.	256703.	256703.	256703.	256703.
ACC. RETAINED EARNINGS	0.	-0.	-0.	-0.	25039.	93978.	164871.	240980.	321880.	415657.
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
LIABILITIES & S/H EQUITY	197268.	458465.	733986.	855675.	825632.	835577.	846873.	863085.	884088.	917968.

*** PULP PLANT IN LITHUANIA ***
BALANCE SHEET (FOR ENDING DECEMBER 31)
BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 2

YEAR	2013	2014	2015	2016	2017	2018	2019	2020	2021
ASSETS	956863.	999974.	1047303.	1098848.	1226257.	1354902.	1483547.	1612192.	1740837.
CURRENT ASSETS	61632.	61632.	61632.	61632.	59599.	59599.	59599.	59599.	59599.
CASH IN HAND	7577.	7577.	7577.	7577.	7577.	7577.	7577.	7577.	7577.
ACCOUNT RECEIVABLE	26155.	26155.	26155.	26155.	26155.	26155.	26155.	26155.	26155.
INVENTORIES	27901.	27901.	27901.	27901.	25867.	25867.	25867.	25867.	25867.
ACC. EXCESS CASH	613277.	713395.	817730.	926281.	1063934.	1200789.	1337645.	1474500.	1611356.
NET FIXED ASSETS	281954.	224948.	167941.	110935.	102724.	94514.	86304.	78093.	69883.
INVESTMENT	817123.	817123.	817123.	817123.	817123.	817123.	817123.	817123.	817123.
NON-DEPR. ASSETS	28831.	28831.	28831.	28831.	28831.	28831.	28831.	28831.	28831.
DEPRECIABLE ASSETS	669357.	669357.	669357.	669357.	669357.	669357.	669357.	669357.	669357.
AMORTIZATION	118935.	118935.	118935.	118935.	118935.	118935.	118935.	118935.	118935.
LESS: ACC. DEPRECIATION	535169.	592175.	649182.	706188.	714399.	722609.	730819.	739030.	747240.
LIABILITIES	185711.	125814.	65916.	6019.	6019.	6019.	6019.	6019.	6019.
CURRENT LIABILITIES	65916.	65916.	65916.	6019.	6019.	6019.	6019.	6019.	6019.
ACCOUNT PAYABLE	6019.	6019.	6019.	6019.	6019.	6019.	6019.	6019.	6019.
CURRENT PORTION OF L/T DEBT	59897.	59897.	59897.	0.	0.	0.	0.	0.	0.
SHORT TERM DEBT	0.	0.	0.	0.	0.	0.	0.	0.	0.
FIXED LIABILITIES	119795.	59897.	0.	0.	0.	0.	0.	0.	0.
LONG TERM DEBT BALANCE	119795.	59897.	0.	0.	0.	0.	0.	0.	0.
OTHER FIXED LIABILITIES	0.	0.	0.	0.	0.	0.	0.	0.	0.
STOCK HOLDERS EQUITY	771152.	874161.	981386.	1092829.	1220238.	1348883.	1477528.	1606173.	1734818.
SHARE CAPITAL	256703.	256703.	256703.	256703.	256703.	256703.	256703.	256703.	256703.
ACC. RETAINED EARNINGS	514449.	617458.	724684.	836126.	963535.	1092180.	1220825.	1349470.	1478116.
LIABILITIES & S/H EQUITY	956863.	999974.	1047303.	1098848.	1226257.	1354902.	1483547.	1612192.	1740837.

Table 7

*** PULP PLANT IN LITHUANIA ***
 LONG TERM DEBT
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

PAGE 1

AMOUNT OF DEBT 598973.
 INTEREST RATE 10.000 PER CENT/YEAR
 REPAYMENT 10 YEAR-EQUAL-INSTALLMENT-REPAYMENT (SEMI ANNUAL)

YEAR	SER. NO	PRINCIPAL	INTEREST	DEBT SERVICE	BALANCE AFT. PAYMENT
2003	1	0.	0.	0.	64980.
	2	0.	0.	0.	129961.
2004	3	0.	0.	0.	214129.
	4	0.	0.	0.	298297.
2005	5	0.	0.	0.	394277.
	6	0.	0.	0.	490256.
2006	7	0.	0.	0.	544614.
	8	0.	0.	0.	598972.
2007	9	29949.	29949.	59897.	569024.
	10	29949.	28451.	58400.	539075.
2008	11	29949.	26954.	56902.	509126.
	12	29949.	25456.	55405.	479178.
2009	13	29949.	23959.	53908.	449229.
	14	29949.	22461.	52410.	419281.
2010	15	29949.	20964.	50913.	389332.
	16	29949.	19467.	49415.	359383.
2011	17	29949.	17969.	47918.	329435.
	18	29949.	16472.	46420.	299486.
2012	19	29949.	14974.	44923.	269537.
	20	29949.	13477.	43426.	239589.
2013	21	29949.	11979.	41928.	209640.
	22	29949.	10482.	40431.	179692.
2014	23	29949.	8985.	38933.	149743.
	24	29949.	7487.	37436.	119794.
2015	25	29949.	5990.	35938.	89846.
	26	29949.	4492.	34441.	59897.
2016	27	29949.	2995.	32943.	29948.
	28	29949.	1497.	31446.	0.
2017	29	0.	0.	0.	0.
	30	0.	0.	0.	0.
2018	31	0.	0.	0.	0.
	32	0.	0.	0.	0.
2019	33	0.	0.	0.	0.
	34	0.	0.	0.	0.
2020	35	0.	0.	0.	0.
	36	0.	0.	0.	0.
2021	37	0.	0.	0.	0.
	38	0.	0.	0.	0.
TOTAL		598973.	314460.	913432.	0.

Table 8

*** PULP PLANT IN LITHUANIA ***
 PROFITABILITY AND FINANCIAL INDICATORS
 BASE CASE - S/H: 55/45(AVERAGE) - (USD 1000)

YEAR	(1) AFT TAX PROFIT -TO- SALES REV (PCT)	(2) AFT TAX PROFIT -TO- S/H EQUITY (PCT)	(3) BFR TAX PROFIT -TO- INVESTMENT (PCT)	(4) AFT TAX PROFIT -TO- S/CAPITAL (PCT)	(5) CURRENT RATIO	(6) QUICK RATIO	(7) DEBT SERVICE RATIO	(8) L/T DEBT -TO- S/H EQUITY	(9)* PROFIT B. E. P. CAPACITY UTILIZE (PCT)	(10)* CASH B. E. P. SALES PRICE (PRICE)	(11)* CASH B. E. P. CAPACITY UTILIZE (PCT)
2007	10.4	8.9	3.1	9.8	1.08	0.65	1.42	63 / 37	72.0	516.5	61.3
2008	23.3	19.7	8.4	26.9	2.28	1.84	1.83	54 / 46	66.4	431.0	56.3
2009	28.3	21.0	10.8	34.5	3.50	3.06	2.06	46 / 54	63.3	401.6	53.2
2010	30.3	19.1	11.6	37.1	4.79	4.34	2.19	38 / 62	60.6	388.8	50.6
2011	32.2	17.5	12.4	39.4	6.12	5.68	2.33	29 / 71	58.1	376.8	48.1
2012	37.3	17.4	16.3	45.7	7.33	6.90	2.29	21 / 79	44.4	365.6	45.8
2013	39.3	16.0	17.2	48.1	8.60	8.18	2.46	13 / 87	41.9	353.6	43.3
2014	41.0	14.7	17.9	50.2	9.93	9.51	2.65	6 / 94	39.4	341.6	40.8
2015	42.7	13.7	18.6	52.2	11.32	10.89	2.86	0 / 100	37.0	329.7	38.3
2016	44.4	12.7	19.4	54.3	138.42	133.79	3.12	0 / 100	34.5	317.7	35.8
2017	50.7	13.1	25.6	62.0	160.95	156.65	*****	0 / 100	12.4	188.1	9.0
2018	51.2	11.9	25.9	62.6	183.69	179.39	*****	0 / 100	12.4	188.1	9.0
2019	51.2	10.9	25.9	62.6	206.43	202.13	*****	0 / 100	12.4	188.1	9.0
2020	51.2	10.0	25.9	62.6	229.16	224.87	*****	0 / 100	12.4	188.1	9.0
2021	51.2	9.3	25.9	62.6	251.90	247.60	*****	0 / 100	12.4	188.1	9.0
AVERAGE1	39.0	14.4	17.7	47.4	81.70	79.70	*****	18 / 82	38.7	317.6	34.6
AVERAGE2	39.5	12.5	15.0	39.8	17.08	16.42	3.16	20 / 80			

(AVERAGE1) : SUM OF ANNUAL FIGURES OF PERCENTAGE AND RATIO IS DIVIDED BY NO. OF YEARS(SIMPLE AVERAGE)

(AVERAGE2) : AVERAGE FIGURES ARE CALCULATED BY ACTUAL VALUES ACCUMULATED OVER THE PROJECT LIFE(WEIGHTED AVERAGE)

* NOTE FOR (9)(10)(11)

WHEN THERE ARE TWO OR MORE PRODUCTS, AND DURING THE YEARS WHEN ALL OF PRODUCTS ARE NOT PRODUCED AT THE SAME RATE OF CAPACITY UTILIZATION, ABOVE BREAK-EVEN-POINTS CANNOT GIVE CORRECT FIGURES.

Table 9-1

*** PULP PLANT IN LITHUANIA ***
 FINANCIAL RATE OF RETURN ON INVESTMENT (IN CONSTANT PRICE)
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

YEAR	FIXED CAPITAL EXPEND.	CHANGE IN WORKING CAPITAL	(1) GROSS CAPITAL EXPENDITR	OPERATING PROFIT	DEPRECIATN	(2) GROSS CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
2003	191236.	2783.	194019.	0.	0.	0.	0.	-194019.	-194019.
2004	236887.	2783.	239670.	0.	0.	0.	0.	-239670.	-239670.
2005	232556.	2783.	235339.	0.	0.	0.	0.	-235339.	-235339.
2006	37509.	11267.	48776.	0.	0.	0.	0.	-48776.	-48776.
2007	0.	29997.	29997.	83439.	84231.	167670.	0.	137674.	137674.
2008	0.	5613.	5613.	121350.	84231.	205581.	0.	199967.	199967.
2009	0.	1467.	1467.	135036.	84231.	219267.	0.	217800.	217800.
2010	0.	54.	54.	135567.	84231.	219798.	0.	219743.	219743.
2011	0.	0.	0.	135567.	84231.	219798.	0.	219798.	219798.
2012	0.	-1134.	-1134.	161657.	57007.	218663.	15985.	219798.	203813.
2013	0.	0.	0.	162791.	57007.	219798.	16840.	219798.	202958.
2014	0.	0.	0.	162791.	57007.	219798.	17558.	219798.	202239.
2015	0.	0.	0.	162791.	57007.	219798.	18277.	219798.	201521.
2016	0.	0.	0.	162791.	57007.	219798.	18996.	219798.	200802.
2017	0.	-2033.	-2033.	209554.	8210.	217765.	50293.	219798.	169505.
2018	0.	0.	0.	211587.	8210.	219798.	50781.	219798.	169017.
2019	0.	0.	0.	211587.	8210.	219798.	50781.	219798.	169017.
2020	0.	0.	0.	211587.	8210.	219798.	50781.	219798.	169017.
2021	-69883.	-53579.	-123462.	211587.	8210.	219798.	50781.	343260.	292479.
	----- 628305.	----- -0.	----- 628305.	----- 2479680.	----- 747240.	----- 3226916.	----- 341072.	----- 2598614.	----- 2257541.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 19.02 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 18.19 PER CENT

Table 9-2

*** PULP PLANT IN LITHUANIA ***
 FINANCIAL RATE OF RETURN ON EQUITY (IN CONSTANT PRICE)
 BASE CASE - S/H: 55/45 (AVERAGE) - (USD 1000)

YEAR	(1) PAID-UP CAPITAL	CHANGE IN WORKING CAPITAL	DEBT SERVICE	OPERATING PROFIT	DEPRECIATN	(2) GROSS CASH IN-FLOW	(3) INCOME TAX	(4) BFR-TAX NET IN-FLOW (2)-(1)	(5) AFT-TAX NET IN-FLOW (4)-(3)
2003	67307.	2783.	0.	0.	0.	-2783.	0.	-70090.	-70090.
2004	92861.	2783.	0.	0.	0.	-2783.	0.	-95644.	-95644.
2005	83560.	2783.	0.	0.	0.	-2783.	0.	-86343.	-86343.
2006	12975.	11267.	0.	0.	0.	-11267.	0.	-24241.	-24241.
2007	0.	29997.	118297.	83439.	84231.	19377.	0.	19377.	19377.
2008	0.	5613.	112307.	121350.	84231.	87660.	0.	87660.	87660.
2009	0.	1467.	106318.	135036.	84231.	111483.	0.	111483.	111483.
2010	0.	54.	100328.	135567.	84231.	119415.	0.	119415.	119415.
2011	0.	0.	94338.	135567.	84231.	125460.	0.	125460.	125460.
2012	0.	-1134.	88348.	161657.	57007.	131449.	15985.	131449.	115465.
2013	0.	0.	82359.	162791.	57007.	137439.	16840.	137439.	120599.
2014	0.	0.	76369.	162791.	57007.	143429.	17558.	143429.	125870.
2015	0.	0.	70379.	162791.	57007.	149418.	18277.	149418.	131141.
2016	0.	0.	64390.	162791.	57007.	155408.	18996.	155408.	136412.
2017	0.	-2033.	0.	209554.	8210.	219798.	50293.	219798.	169505.
2018	0.	0.	0.	211587.	8210.	219798.	50781.	219798.	169017.
2019	0.	0.	0.	211587.	8210.	219798.	50781.	219798.	169017.
2020	0.	0.	0.	211587.	8210.	219798.	50781.	219798.	169017.
2021	-69883.	-53579.	0.	211587.	8210.	273377.	50781.	343260.	292479.
	----- 186820.	----- -0.	----- 913433.	----- 2479680.	----- 747240.	----- 2313486.	----- 341072.	----- 2126668.	----- 1785596.

INTERNAL RATE OF RETURN

ON (4) BFR-TAX NET IN-FLOW (2)-(1) 24.71 PER CENT

ON (5) AFT-TAX NET IN-FLOW (4)-(3) 23.50 PER CENT

Chapter 11 INVESTMENT PROMOTION STUDY

Chapter 11 INVESTMENT PROMOTION STUDY

11.1 Institutional Framework and Structure Related to Foreign Direct Investment

The Government of Lithuania strongly feels the need for foreign direct investment as an essential vehicle for stabilization and development of the country's economy and has been laying the foundations to attract foreign investment. Essentially, it strives to gain confidence of foreign investors by building or modernizing the institutions and systems to be compatible with those in the EU, while providing the environment for foreign firms to conduct business activities freely in more or less the same way as Lithuanian firms. Lithuanian Development Agency has been established as a major vehicle for these efforts and provides support for foreign firms in their feasibility analysis, market research and information service. Nevertheless, the government feels the need for stepping up the efforts to attract foreign investment. (Note: The term "foreign investment," as used throughout this report, refers to direct investment in Lithuania by foreign firms and other organizations.)

- (1) Existing institutions and systems governing foreign direct investment and their implications on the proposed project

- 1) Basic framework

The basic institutional framework governing foreign direct investment in the country is established in the Law Concerning Foreign Capital, which was enacted on December 29, 1990, and amended on June 13, 1995 and July 7, 1999.

Under the law, the foreign investor is defined as a corporation of foreign nationality, a natural person or legal entity who does not have citizenship of the Republic of Lithuania, or any person of non-nationality who has invested foreign capital.

The law has the primary objective of promoting and protecting foreign investment according to the internationally acceptable standards, designed to grant foreign firms all the rights required to conduct economic activities in the country and impose the duties related thereto and allow them to invest in all

industrial sectors with a few exceptions, while mandating the establishment of the adequate institutions and systems to promote and facilitate foreign investment. It warrants unlimited transfer by any foreign firm of its profit, income and dividend after paying required taxes and other charges.

The foreign investor is authorized to conduct business activities by establishing his own firm or acquiring shares of an existing firm, and can sell or transfer the shares to a third party according to the procedures set forth under the law. In fact, Lithuania allows the establishment of a corporation wholly owned by foreign capital. The law also permits the foreign-owned firm to obtain a loan, rent property, and enter into a license or lease agreement with a local entity.

Finally, any dispute related to the right or duty of the foreign firm may be settled by the Lithuanian government or through the international arbitration procedures.

In addition to the foreign investment law, Lithuania has introduced a variety of laws that have important bearings on foreign firms and their business activities in the country, including the tax law, the company law, the bankruptcy law and the anti-monopoly law. In fact, they are designed to form the legal infrastructure that satisfies the requirements for the EU membership, which will be critical for the country's growth in all aspects. The country is therefore making a steady progress in providing the legal environment for foreign firms to enjoy the treatment equivalent to local residents, fairly close to that available in the EU.

The government is implementing a variety of measures to provide incentives for business activities, both domestic and foreign companies, including the deduction of the investment cost from the taxable income, the establishment of a free economy zone (not fully contributing), and simplification of legal procedures.

2) Industrial sectors restricting foreign investment

Foreign firms are restricted from entry into the following sectors:

Those related to national security;

Those related to narcotics and toxic substances; and

Those related to gambling.

There are several sectors that require government license for entry. As of September 1997, business activities in 25 sectors required a license, including insurance, communication, the manufacture and marketing of pharmaceutical, tobacco and alcohol products, and financial auditing.

3) Property ownership

Foreign firms have the right to own or lease real property. They can own or use any buildings except for some cultural or historical heritages.

Any firm can lease state-owned land for 99 years, while private land can be leased for a period agreed by its owner and tenant. Legal procedures for land leasing are set forth in the Resolution on the Sales and Lease of Land Used for Non-agricultural Activity, dated March 9, 1999.

Foreign firms (those based in EU member and associate member countries, NATO member countries, and OECD countries) can own and use non-farm land.

In addition, the government plans to lift the restriction on farmland acquisition to allow the purchase by foreign firms. In fact, the study team learned from a source during the field survey that foreign firms would soon be allowed to own farmland.

Meanwhile, as pointed out later, many administrative procedures, such as land acquisition and construction permit, reportedly take considerable time and effort to require significant improvement.

4) Foreign investment system and its relationship with the proposed project

As Lithuania has steadfastly been developing an investment climate to attract foreign firms, including the legal system and the institutional framework, there are no significant institutional barriers to foreign investment. From the viewpoint of the proposed project, the paper and pulp industry is open to foreign investment. As the industry requires large land areas for production activity, it is critical for implementation of the proposed project to secure land

suitable for paper and pulp making operations. Land ownership is restricted if farm land is involved. More importantly, however, negotiation with the government will be important because large projects involving foreign direct investment, like the proposed project, have been carried out under special arrangement with the government, including land acquisition.

While the country appears to have the sufficient institutions and systems to facilitate foreign investment, it is pointed out that there are a number of problems related to their operation and management, as discussed later. They should be properly addressed and dealt with by the Lithuanian government in order to ensure successful implementation of the proposed project.

5) Remaining issues and government actions

Thus, while the Lithuanian government has been promoting a number of reforms, there are many unresolved issues to maximize their effectiveness.

In 1999, the Foreign Investment Advisory Service, the World Bank and the IFC conducted `Lithuania – Study of Administrative Barriers to Investment` under the aid of the USAID.

The study report indicates that Lithuania imposes a relatively large number of regulations, rules and restrictions compared to other Baltic states and East European neighbors including Poland, Czech and Hungary. Furthermore, these regulations are frequently revised without instruction or notification to individual firms, resulting confusion among them. It is also pointed out that government officials are not “amiable” in dealing with the public.

To promote further reforms on the basis of the recommendations made in the study report as well as its own plans, the Lithuanian government established the Supervisory Commission for Preparation of Strategic Plan on Improvement of Business Environment at the end of 1999. The commission is headed by the vice minister of the Ministry of Economy and consists of the following twelve groups: (1) taxation; (2) customs; (3) land acquisition; (4) construction regulation; (5) the bureaucratic system and its control; (6) liberalization of the labor market; (7) the fostering of small- and medium-sized enterprises; (8) trade

restriction; (9) restructuring of bankrupt enterprises; (10) capital markets; (11) reforms of business conditions; and (12) IT.

As these groups are represented by authorities and organizations concerned, however, strenuous efforts will be required to make the groups work as originally planned.

Note: Major areas of improvement recommended in the study report

1. Streamlining of commercial registration procedures at local government levels;
2. Elimination of discriminatory treatment of foreign firms in intellectual property registration fees;
3. Modernization of complicated and unfair land acquisition procedures;
4. Streamlining of land registration procedures;
5. Simplification of the construction permit process that contains unnecessary and redundant procedures;
6. Simplification of complicated licensing procedures and elimination of unfair treatment of foreign firms in license fee;
7. Upgrading of tax audit that creates heavy burdens on individual firms;
8. Elimination of commercial transaction and movement records that are attached to tax returns;
9. Streamlining of customs clearance procedures that require further improvement;
10. Simplification of hiring and dismissal procedures for corporate employees; and
11. Establishment of transparent inspection guidelines for customs and other government inspection procedures to reduce bribery and simplification of inspection.

11.2 Current State of Operations by Foreign Firms in t

(1) Recent trends in foreign direct investment in Lithuania

1) Overall trends

The country has been actively inviting foreign firms to invest since 1990. As a result, foreign direct investment has been on the rise between 1990 and 1999. The aggregate amount of investment up to the end of 1999 was USD2,413 million. During the period, foreign investment grew rapidly in the second half of the 1990s as the national economy grew strongly. The country received direct investment of USD348 million in 1996 and the total investment cleared USD1 billion mark in 1997. In 1998, despite the significant negative impacts on export industries by the currency crisis in Russia, direct investment amounted to USD934 million; USD350 million being poured into the privatization of Lithuania Telecom and USD584 million that were invested in a large number of projects. In 1999, the amount reached USD38 million, a pace exceeding that in 1996 and 1997. The impressive results indicate that the country has many advantages for foreign investment. It is therefore a major task for the government to capitalize on and reinforce the existing advantages in order to attract foreign firms on a continuous basis.

Table 11.2.1 Recent Trends in Foreign Direct Investment in Lithuania

(Unit: Million USD)

	Aggregate total to the current year	Direct investment (less the aggregate total to the previous year)
1995	352	-
1996	700	348
1997	1041	341
1998	1975	934
1999	2413	438

Source: Lithuanian government (including privatization of Lithuania Telecom)

2) Breakdown by country

Lithuania receives foreign investment representing a variety of countries. As of the end of 1999, the largest investor was Sweden (22%), followed by Finland (16%), the United States (11%), Denmark (8%), Germany (7%), the United Kingdom (6%), Switzerland (5%), Norway (3%), Luxembourg (3%) and Estonia (3%), with the remaining 16% coming from other countries.

Thus, foreign direct investment is dominated by Scandinavian, West European and U.S. companies. In recent years, investment from neighboring countries has been on the rise. Aside from the geographical proximity to Scandinavia and Western Europe, Lithuania has notably been attracting U.S. firms partly because they consider the country as a keystone of their business strategy targeting Eastern Europe and partly because Lithuanian communities in the U.S. are gaining economic power. On the other hand, direct investment from Asia, including Japan, has been negligible so far and is limited to textile projects by Japanese shoushas (multinational trading houses) and investment in electrical and electronics businesses by Korean firms. Asian companies have been active in making direct investment in other East European countries, including the Czech Republic, Hungary and Poland, whereas they did not have much information on the Baltic States because they did not have embassies in the area.

In the future, the area including Lithuania will attract global attention as the discussion on the extended EU arises.

Table 11.2.2 Breakdown of Foreign Direct Investment by Country of Origin (Outstanding at the end of 1999)

Country name	Percentage share
1 Sweden	22
2 Finland	16
3 U.S.A.	11
4 Denmark	8
5 Germany	7
6 U.K.	6
7 Switzerland	5
8 Norway	3
9 Luxemburg	3
10 Estonia	3
Others	16

Source: Lithuanian government

3) Breakdown by industry

Based on the outstanding value as of January 2000, direct investment in the communication area (particularly related to Lithuania Telecom) accounts for

the highest share of 30%, followed by manufacturing (27%), distribution (21%), and others (22%).

Table 11.2.3 Breakdown of Foreign Direct Investment by Industry
(Outstanding as of January 2000) (%)

	Percentage share
Communication service	30
Manufacturing	27
Distribution	21
Others	22

Source: Lithuanian government

Sectors with a high prospect for foreign direct investment are listed below:

- Wood (lumber, furniture, paper and pulp)
- Textile and apparel
- Electrical equipment, machinery and information technology
- Food processing, farm/forestry/fishery products, and dairy products
- Chemicals and pharmaceuticals
- Ship building and repairs
- Refining of oil products
- Transportation and distribution
- Finance
- Natural resources and energy

4) Large investment projects

In Lithuania, large investment projects are underway in recent years. They can roughly be classified as follows:

Projects to privatize previously state-owned services, such as telecommunications;

Those using local resources and targeting the EU market, such as food processing, textiles, bicycles, refrigerators and furniture; and

Those using natural resources from Russia (import processing) and aiming at foreign markets, such as petroleum refining.

In fact, these projects represent general images of foreign firms suitable for operation in Lithuania. Analysis of these images will clarify the country's

comparative advantages for foreign firms and help determine whether these advantages can be maintained in the future.

On the other hand, analysis of 30 largest projects (total of USD1292 million) depicts the following findings related to foreign investment in the country:

- The top 30 projects are dominated by investment from neighboring countries (Scandinavian and Baltic), totaling USD822 million and account for 64%, and 9 projects are made by Swedish concerns (USD733 million, 57% share).
- The second largest investor next to Sweden is the U.S. (USD156 million, 12%).
- 9 projects (USD752 million, 58%) were invested by multinational consortiums, suggesting that the joint approach is widely used to carry out large projects probably because of the need to spread the risks involved. The proposed project is also large in scale and presents a sizable risk that may be too large for a single company to assume.
- There is no apparent concentration on specific industries. The 30 projects cover 21 industries. This appears to reflect global strategies of foreign firms who have chosen to invest in the country for a variety of reasons, e.g., business opportunities created by privatization, the effective use of local resources, and exploration of new markets.

Overall, large investment projects come from Scandinavia (especially Sweden) and the U.S.

11.3 Case Study Analysis of Foreign Firms Operating in the Country

During the field survey, interview surveys were conducted for 10 foreign firms operating in the country, mainly Vilnius, and organizations related to promotion of foreign direct.

Based on the results of the interview surveys, major characteristics of foreign companies investing in Lithuania are described as follows.

(1) General profiles

General profiles of the foreign firms interviewed are summarized below.

Table 11.3.1 List of Foreign Firms Interviewed

Name	Country	Industry	Employment	Revenues
A	Austria	Confectionery	600	USD53 million
B	Iceland	Intravenous drops and medicine	105	NA
C	Canada	Lumber and chips	80	USD1.5 million
D	Denmark	Corrugated cardboard boxes	60	NA
E	Finland	Heat insulation materials	140	USD12.5 million
F	U.S.	Meteorological equipment	121	USD1.25 million
G	U.S.	Communication service	410	NA
H	U.S.	Sales of computer software	25	NA
J	Finland	Corrugated cardboard boxes	350	USD12.5 million
I	Ireland, Switzerland	Color TV picture tubes	3,600	USD100 million

(Source) Interview surveys

(2) Role of Lithuanian base and major market

Of the ten firms, four have regional headquarters (for the Baltic States or others) in Lithuania. Most firms serve extensive markets including the Baltic States, the CIS countries, West Europe, and the U.S. For those serving the Baltic States, it is a logical choice to establish their regional headquarters in Lithuania that has the largest population in the relatively small region. Also, I company is an example of a manufacturer having high levels of production technology, which have attracted foreign investors (partners), including Turkey, Italy and France.

On the other hand, two companies responded that they served the domestic market only. G company is in telecommunications business which is heavily

regulated in the region and is not likely to enter other markets as the company is still in the initial stage of operation in the country. H company, as a multinational firm operating globally, has its activity bases in major countries. Other seven firms are effectively serving as regional headquarters to reflect the country's unique geographical location connecting the CIS, the Baltic States and Western Europe.

Table 11.3.2 Role of Foreign Firms Operating in Lithuania and Major Markets

Name	Function	Major markets (composition)
A	Regional headquarters for the Baltic States and the CIS	Lithuania 70%, Latvia 24% and the CIS 6% (mainly Russia and Belarus)
B	Regional headquarters for the Baltic States and the CIS	Lithuania 60%, 40% other Baltic States, Czech, the CIS
C	Headquarters	Lithuania 20%, West Europe 80% (the U.K., Denmark, the Netherlands)
D	Regional headquarters for the Baltic States	Lithuania 75% and other Baltic States 25%
E	Headquarters	Lithuania 50% and other Baltic States 50%
F	Headquarters	The U.S. 57%, Switzerland 17%, Baltic States 2%, Lithuania 4%, the CIS 2% and others 18%
G	Headquarters	Lithuania only
H	Headquarters	Lithuania only
I	Headquarters	Turkey 55%, Lithuania 17%, France 16%, Italy 6%, Poland 6%
J	Regional headquarters for the Baltic States	Corrugated cardboard boxes to Lithuania, soft fiberboard to Poland and Germany, and egg containers to the Baltic States and Russia

(Source) Interview surveys

(3) Background and reason for investment

Most firms have decided to invest in Lithuania for the purpose of exploring new markets created by the collapse of the Soviet Union (Central and Eastern Europe, the Baltic States and the CIS). Major reasons for selection, as cited, include: (1) the largest population in the Baltic States; (2) availability of technological resources and skills; (3) the government's promotional efforts including incentives and privatization; (4) abundant raw materials; and (5) low-cost labor force.

Table 11.3.3 Background and Reason for Investment

Name	Objective	Reason for selection
A	Development of Central/Eastern European markets	Availability of modern factories, largest population in the Baltic States, abundant raw materials, and production technology and skills
B	Development of the CIS market	Invited by the Lithuanian government
C	Development of European markets	Availability of modern factories, largest population in the Baltic States, abundant raw materials, and production technology and skills
D	Development of the Baltic markets	Largest population in the Baltic States, low-cost labor force, government incentive
E	Development of the Baltic markets	Largest population in the Baltic States, proximity to the CIS, abundant supply of engineers, government incentive
F	To use high technological capabilities	Availability of technological resources and skills
G	A Lithuanian-American businessman returns to his home country in order to capitalize on growth opportunity for communication business accompanied by deregulation.	Returning of the president to his home country and privatization
H	Development of the Baltic markets	To secure the Lithuanian market
I	Business expansion using high levels of production technology and low-cost labor force	Privatization, technical skills and low-cost, high quality labor force
J	Development of the Baltic markets	Privatization

(Source) Interview surveys

(4) Major issues facing foreign firms and a future outlook for the business environment

Foreign firms exporting their products to Western Europe and the Baltic States, such as C company, are concerned about the appreciation of the local currency. For those which are required to shift their export markets from Russia to the EU, the strong Litas is a major handicap in the short run. Also, it presents a serious risk for firms who intend to invest in the country. The second issue is poor operation and management of the current institutions and systems to support foreign investment, as pointed out in the interview surveys where some firms point out inadequate or slow government actions, while the government has the ability to do it in terms of institutions and resources. At the same time, many respondents pointed out negative impacts of the currency crisis in Russia and are concerned about stabilization of the economy. Surprisingly, however, all respondents expressed a bright outlook for the future business environment. They feel that the current recession has hit the bottom as some signs of economic stability and growth began to be seen in the second half of 1999.

Table 11.3.4 Current Issues Facing Foreign Firms and Their Future Outlook for the Business Environment

Name	Major issues	Outlook for the future business environment
A	Poor or slow government action related to taxation and other issues	Getting better
B	VAT on medical parts and supplies	Getting better
C	Overvalued currency Difficulty in negotiation with the government related to the securing of lumber resources	Getting better
D	Frequent changes in various systems without instruction or advice concerning desirable action Overvalued currency	Getting better (having a business expansion plan)
E	Reduction of public works due to public investment cutbacks, and decline in construction works ordered by the private sector due to the Russian crisis	Getting better
F	Not particular	Getting better (having a business expansion plan)
G	Not particular	Getting better Growing demand from local firms
H	Negative impact of the Russian crisis on the Lithuanian economy	Getting better
I	Overvaluation of Litas against the Europe (although within a manageable range) Poor business service and low standards of living in rural regions (for foreign firms)	Getting better; expansion plan; aiming to obtain 15-20% share for small- and medium-sized color TV picture tubes in the EU market.
J	Economic instability, poor financial service, high interest rates, poor business service	Getting better Many firms are shifting exports from Russia to the EU.

(Source) Interview surveys

(5) Strengths (advantages) and weaknesses (disadvantages) of Lithuania as place of investment

Major strengths cited by the foreign firms who responded the interview survey are summarized as follows:

- Highly skilled, abundant, low-cost labor force
- Well-developed transportation networks
- Strategic location bridging the EU and the CIS
- Low production costs, including living costs
- Social stability (politics and relations with Russia)
- A small number of labor disputes
- Abundant raw materials
- Excellent universities and colleges

In fact, these advantages should be widely advertised and used as differentiating factors when competing with other host countries.

On the other hand, major weaknesses are summarized as follows:

- Slow, inefficient government service and complicated procedures
- Frequent changes in public administration systems and regulations without sufficient instruction or advice
- Complicated procedures related to foreign investment
- Poor financial services sector (but improving)
- Inefficient agricultural sector
- Poor education and public health systems (in rural area)
- Relatively high economic dependency on Russia
- Small market

Overall analysis of these weaknesses and major issues pointed out earlier indicates that the major issue facing foreign firms operating in the country is related to inefficient public service. No respondent cited a labor problem or poor infrastructure. Nevertheless, foreign firms seem to operate their business relatively steadily by enjoying the country' s geographical advantage, good infrastructure and abundant labor supply.

**Table 11.3.5 Strengths (Advantages) and Weaknesses (Disadvantages)
of Lithuania for Foreign Investment**

Name	Strengths (advantages)	Weaknesses (disadvantages)
A	Well-development transportation networks Abundant human resources Proximity to the CIS Few labor disputes Low living costs	Slow public service Inefficient agricultural sector Poor financial service
B	Abundant human resources Proximity to the CIS Few labor disputes Good relation with Russia (social stability)	Slow public service Complicated procedures required for foreign investment and its approval Poor financial service
C	Well-development transportation networks Proximity to the EU market Abundant raw materials	Slow public service Inefficient public service with complicated procedures Poor education and public health systems Poor financial service
D	Largest population in the Baltic States Strategic location bridging the CIS and Western Europe Well-development transportation networks Highly skilled work force	Frequency changes in public administration systems and procedures without adequate instruction or advice from the government
E	Largest population in the Baltic States Proximity to the CIS Highly skilled work force Low cost labor	Poor financial service High economic dependency on Russia
F	Highly skilled work force Low operating cost	Poor financial service
G	Highly skilled work force Well-development transportation networks Stable political condition Strategic location bridging the CIS and Western Europe	Poor financial service Difficulty in negotiating with local government concerning land acquisition Slow pace of privatization
H	Highly skilled work force Excellent universities and colleges Low cost labor force Well-development transportation networks	Slow public service Frequency changes in public administration systems and procedures without adequate instruction or advice from the government
I	Highly educated/skilled and low-cost labor force	Poor business service and low standards of living in rural regions
J	Largest population in the Baltic States Highly skilled work force Low cost labor Proximity to the CIS and Poland	Small domestic market Insufficient public service with complicated procedures Complicated procedures required for foreign investment and its approval Frequently changes in public administration systems and procedures without adequate instruction or advice from the government

(Source) Interview surveys

11.4 Current State of Operations by Foreign Firms in Latvia

(1) Recent trends in foreign direct investment in Latvia

Foreign direct investment in the country has been on the steady rise since its independence. In 1998, however, the growth rate slowed down, presumably affected by the financial crisis in Russia because Riga, national capital, has historically served as a gateway to and a distribution center for the Russian economy but the country's relationship with Russia became uncertain at that time.

Table 11.4.1 Recent Trends in Foreign Direct Investment in Latvia

(USDmillion)		
	Aggregate total to the current year (private enterprises)	Direct investment (less the aggregate total to the previous year)
1995	615	-
1996	944	329
1997	1291	347
1998	1501	210
1999	1876	375

Source: Latvian government

Latvia receives the largest foreign investment from Denmark, followed by the U.S., Germany, Sweden, the U.K., Russia, Estonia, Ireland, Norway and Singapore, with the remaining 19% coming from other countries. While Scandinavian, West European and the U.S. are major investors, the country differs from Lithuania in that Russia and Singapore are included into the top ten countries and percentage share is relatively evenly spread within the top ten group. This reflects the observation that the country is a logical choice for multinationals which intend to establish their base in the Baltic States because it is located in the center of the region.

Table 11.4.2 Breakdown of Foreign Direct Investment by Country of Origin (1999)

Country name	Percentage share
1 Denmark	16
2 U.S.A.	11
3 Germany	10
4 Sweden	9
5 U.K.	8
6 Russia	8
7 Estonia	6
8 Ireland	6
9 Norway	4
10 Singapore	3
Others	19

Source: Latvian government

An industrial sector receiving the highest percentage of foreign direct investment is transportation and communication, followed by finance. In the transportation and communication sector, investment comes from Finland and Norway (port service), Germany (physical distribution facilities), as well as Finland (communication). Investment in the financial sector comes from Sweden, Germany, Estonia and Finland.

Also, relatively large investments in food processing, wood processing, distribution of petroleum products and trade sectors are noticeable in the country.

Table 11.4.3 Breakdown of Foreign Direct Investment by Industry (1999)

	Percentage share
Manufacturing	20
Distribution	16
Transportation and communication	25
Finance	21
Others	18

Source: Latvian government

Industrial sectors which are considered to have a good prospect for foreign investment in the future are as follows:

- IT
- Electrical/electronics
- Chemical and pharmaceutical
- Wood processing
- Food
- Textile

Large projects are expected in the communication and financial sectors.

(2) Case Study Analysis of Foreign Firms Operating in Latvia

The study team interviewed 10 foreign firms operating in the country, under the assistance of the Latvia Development Agency.

Based on the results of the interview surveys, major characteristics of foreign firms operating in Latvia are identified as follows.

General profiles

General profiles of the foreign firms interviewed are summarized below.

Table 11.4.4 List of Foreign Firms Interviewed

Name	Country	Industry	Employment	Revenues
A	Estonia, Norway	PC and software sales	52	N/A
B	Finland, Sweden	Banking system related to bank card	92	USD4.3 million
C	U.S.A.	Manufacture and sales of coating machine	220	USD9 million
D	Estonia	R&D, manufacture and sales of medical products	500	USD16.9 million
E	Norway	Wood transportation and related service	30	N/A
F	Singapore	Manufacture and sales of plastic processing machinery	400	N/A
G	Germany	Banking and corporate finance	55	N/A
H	Germany	Physical distribution service	80	USD25 million
I	Iceland	Real estate leasing	20	N/A
J	Iceland	Manufacture and sales of plastic products	116	USD8 million

Source: Interview surveys

Role of Latvian operation and major markets

Among the ten foreign firms, three primarily serve the domestic market. They are all service industries, A company (software), G company (banking) and H company (physical distribution). On the other hand, the manufacturers (machinery, chemical or pharmaceutical) export their products worldwide.

Interview surveys revealed that they are highly valued by foreign partners for their high levels of production technology since the former Soviet era.

Table 11.4.5 Role of Foreign Firms Operating in Lithuania and Major Markets

Name	Function	Major market
A	Local headquarters, sales agents of IBM and HP	Latvia 100% 10% of Latvian PC market
B	Headquarters One of six major companies throughout the world	Latvia 25%, Baltic States, East Europe and CIS countries 75%
C	Headquarters	USA 60%, Europe 25%, Asia 15%
D	Headquarters	Latvia 27%, other Baltic states 15%, Russia 17%, other CIS 14%, Europe 13%, Japan 14%
E	Headquarters	Pulp: U.K. 37%, Sweden 21%, Germany 14%, others 28% Wood: U.K. 60%, others 40%
F	Headquarters	U.S. 50%, Scandinavian countries 30%, Europe 20%
G	Regional headquarters (Baltic)	Latvia 85%, other Baltic states 15%
H	Local headquarters	Latvia 60%, affiliated companies in various countries 40%
I	Local headquarters	Tenants consist of 4 foreign companies and 2 local companies
J	Regional headquarters (Baltic)	Latvia 30%, others (Scandinavia and Europe) 70%

Source: Interview surveys

Background and reason for investment

Many firms decided to operate in Latvia in consideration of its central position in the Baltic States, which offers them advantage in serving the major markets of the Baltic and CIS countries. On the other hand, there are former state enterprises, such as C company and D company, which successfully attracted foreign investors at the time of privatization because of high levels of production technology. Generally, low operating costs constitute a major factor for investment decision. Compared to Lithuania for which some respondents cited “ the largest population in the Baltic States” as a reason for investment, a key expression used by foreign firms operating in Latvia is “ the geographical center in the Baltic States.” Thus, Latvia attracts foreign firms which operates business covering broad areas including the Baltic States and CIS countries.

Table 11.4.6 Background and Reason for Investment

Name	Objective	Reason for selection
A	Market development in Latvia Business expansion from Estonia	A typical move of firms in Estonia and Finland, which proceeds with market development from Estonia to Latvia, then Lithuania
B	Expansion in the Baltic States and the CIS markets	Able to obtain highly skilled labor force and establish a strategic center to serve the Baltic States and the CIS countries.
C	High levels of production technology and low-cost, high quality labor force.	To capitalize on the privatization project and the former state enterprise' s high levels of aerospace technology
D	High levels of production technology and low-cost, high quality labor force.	To capitalize on the privatization project as well as the former state enterprise' s high R&D capabilities.
E	Expansion in the Baltic States and the CIS markets	Geographical proximity to the Baltic States and the CIS countries Opportunity for business expansion in log transportation service To capitalize on the central position in the Baltic States.
F	Low-cost and high quality labor force.	To capitalize on the privatization project as well as low labor and operating costs.
G	Expansion in the Baltic States and the CIS markets	To capitalize on the central position in the Baltic States.
H	Expansion in the Baltic States and the CIS markets	To capitalize on the central position in the Baltic States.
I	Expansion in the Baltic States and the CIS markets	To capitalize on the central position in the Baltic States.
J	Low-cost and high quality labor force.	To capitalize on the privatization project as well as low labor and operating costs.

Source: Interview surveys

Major issues facing foreign firms and a future outlook for the business environment

Overall, only one firm cited a major problem to hinder their business, namely poor service of local government. The complaint by a company on inefficient customs clearance at the Lithuania and Poland borders was cited as an episode symbolizing inefficient government service in Lithuania. At present, customs clearance is still required at both sides of the border, although some improvement has been made, constituting a major source of complaint from other countries. For effective solution, negotiation and arrangement with the Polish government is required.

Generally, there are much less complaints about poor government service in comparison to Lithuania, reflecting the fact that the Latvian government has been successfully reforming its service and quality over a short period of time. All respondents expressed a better outlook for the future business environment such as foreign firms in Lithuania. They think the russisn crises already passed.

Table 11.4.7 Current Issues Facing Foreign Firms and Their Future Outlook for the Business Environment

Name	Major issues	Outlook for the future business environment
A	Financial access to SMEs Small market	Getting better
B	Double taxation with Russia Shortage of IT engineers Public image about backwardness compared to Estonia	Getting better
C	Having overcome the danger of losing the market after independence, business is rapidly recovering and expanding. No major problem exists.	Getting better
D	Shortage of experts in medical and chemical fields	Getting better
E	Poor public service at local government level	Getting better A large number of projects related to log transportation
F	Inefficient customs clearance at the Poland and Lithuania borders	Getting better
G	Shortage of financial experts	Getting better
H	The currency is overvalued against the Euro due to pegging to SDR, although no major impact is felt.	Getting better (Efforts should be made to compensate for loss of customs clearance service after the country' s participation in EU.)
I	Relatively high dependency on the Russian economy	Getting better
J	Small market, although not significant difference among three countries	Getting better

Source: Interview surveys

Strengths (advantages) and weaknesses (disadvantages) of Latvia

Major strengths of Latvia as the host country, identified by the survey respondents, are as follows:

- Availability of low-cost and highly skilled labor force and competent engineers
- Strategic geographical location bridging the CIS and the EU
- Free market
- Presence of a large number of R&D organizations
- Well-developed transportation network
- Government' s quick response
- Future growth potential

Compared to Lithuania, three attributes are unique to Latvia, “ free market,” “ availability of competent engineers” and “ government' s quick response.”

Although the limited number of samples prohibit generalization, these responses clearly indicate that the market economy in the country has reached at a fairly advanced stage. This is evidenced from the results of the follow-up survey of government service as well as an open atmosphere felt during the interview survey.

On the other hand, the following weaknesses were identified:

- Shortage of human resources
- Poor financial service for SMEs
- Public image about backwardness compared to Estonia
- Lack of tax incentives for investment projects
- Inefficient bureaucratic service at local government level
- Relatively high dependency on the Russian economy
- Frequent changes in government programs and systems with lack of communication by government
- Small market

Compared to Lithuania, there are much less responses to point out inefficient or slow public service. While inefficiency in government service exists in Latvia (as much as that in industrialized countries), more foreign firms in Lithuania feel it as a major weakness.

Table 11.4.8 Strengths (Advantages) and Weaknesses (Disadvantages) of Latvia for Foreign Investment

Name	Strengths (advantages)	Weaknesses (disadvantages)
A	Low-cost labor force	Insufficient public support for the IT sector Poor financial service for SMEs
B	The geographical center in the Baltic States Free market Government's quick response Low-cost and highly skilled labor force	Public image about backwardness compared to Estonia Shortage of IT engineers and related human resources
C	Availability of low-cost and highly skilled labor force and competent engineers	Not particular
D	Presence of many R&D organizations Presence of chemical and medical R&D bases Availability of high quality engineers	Lack of tax incentives for investment projects
E	Future growth potential A large number of related projects Strategic geographical location bridging the CIS and the EU Well-developed transportation network Availability of competent engineers Low-cost and highly skilled labor force	Inefficient, bureaucratic service at local government level
F	Availability of competent engineers Low-cost and highly skilled labor force	Possible drain of workforce after the EU participation
G	Availability of competent engineers Strategic geographical location bridging the CIS and the EU Free market	Relatively high dependency on the Russian economy Shortage of financial experts
H	Strategic geographical location bridging the CIS and the EU	Not particular
I	Geographic proximity to the CIS and Poland Low labor and operating costs Availability of competent engineers	Frequent changes in government programs and systems with lack of communication by government
J	Availability of competent engineers Strategic geographical location bridging the CIS and the EU Low labor and operating costs	Small market

Source: Interview surveys

(3) Improvement of public service for foreign firms in Latvia

In 1998, the Foreign Investment Advisory Service (FIAS) of the World Bank submitted a report on administrative barriers to investment in Latvia, based on the survey similar to the one conducted in Lithuania last year. In response, the Latvian government carried out extensive discussion involving both the public and private sectors. Then, the prime minister established the Working Group organized by representatives of the chambers of commerce and industry of the U.S., the U.K., Germany and Sweden, together with government officials at national and local levels. In particular, the chambers of commerce and industry provided important advice in the form of international best practices. From the FIAS report and the discussion of the Working Group, 30 action plans were

proposed and approved by the cabinet in 1999. The action plans have been implemented by various ministries and agencies, while their progress is monitored by the EU/Phare and the Latvia Development Agency. The monitoring result was compiled to a report in June 2000, entitled “ Project to Improve the Business Environment in Latvia: Progress Assessment.” Various areas of improvement are contained in the report.

During the same period, the Foreign Investors’ Council in Latvia was established by representatives of foreign firms operating in the country. It has been held semiannually to exchange opinions and views with the government. The steering committee was established and the council made an implementation plan for improvement of the business environment, which was approved by the cabinet in February 2000.

Table 11.4.9 Key Areas of Improvement in Government Service

Item	1998	2000
Immigration	One hour	15 – 20 minutes
Customs clearance	1 – 5 hours	15 minutes (for loaded trucks)
Transfer of property ownership	1.5 – 12 months	2 weeks to 3 months
Real estate appraisal	1 week – 3 months	5 – 10 days
Construction permit	1 – 1.5 years	3 – 6 months
Work/residence permit	50 – 60 days	35 days at maximum

11.5 Current State of Operations by Foreign Firms in Estonia

(1) Recent trends in foreign direct investment in Estonia

Foreign direct investment in Estonia has been steadily increasing since independence, albeit relatively large variations from year to year.

Table 11.5.1 Recent Trends in Foreign Direct Investment in Estonia

(USDmillion)

	Aggregate total to the current year	Direct investment (less the aggregate total to the previous year)
1995	1173	-
1996	1324	151
1997	1590	266
1998	2163	573
1999	2467	304

Source: Estonian government

By country, Sweden is the largest investor, followed by Finland, the U.S., Denmark, Norway, Germany, the U.K., the Netherlands, Russia and Liechtenstein. While Northern Europe, Western Europe and the U.S. are major investors, the fact that the top two countries, Sweden and Finland, account for more than 70% of the total is unique to Estonia, making a sharp contrast to Lithuania and Latvia. This reflects strong influence of Sweden and Finland on Estonia in economy and other areas.

Table 11.5.2 Breakdown of Foreign Direct Investment by Country of Origin (Outstanding as of 1999)

Country name	Percentage share
1 Sweden	41
2 Finland	32
3 U.S.A.	4
4 Denmark	4
5 Norway	3
6 Germany	2
7 U.K.	2
8 The Netherlands	2
9 Russia	1
10 Liechtenstein	1
Others	8

Source: Estonian government

Industrial breakdown again indicates a high percentage of the communication and transportation sector. The Estonian government is fostering the IT industry and communication investment largely comes from Sweden and Finland. With the installation of optical fiber networks, the laying of submarine cables connected to Sweden and Finland, and the Internet connection to all schools, the IT infrastructure in the country is on the rapid rise, and IT-related industries are emerging. In the manufacturing sector, investment from Sweden, Finland, and the U.S. is directed to the electronics and electrical industries, while the petroleum and chemical industries receive investment from the Netherlands and the U.S. In addition, foreign investment is expected in the wood processing, food processing and other areas.

Table 11.5.3 Breakdown of Foreign Direct Investment by Industry
(Outstanding Value as of 1999)

	Percentage share
Manufacturing	21
Distribution	16
Transportation and communication	31
Finance	21
Others	7

Source: Estonian government

Sectors considered to have a good prospect for foreign investment are as follows:

- IT
- Electrical and electronics
- Wood processing
- Food
- Textile
- Physical distribution and transportation

Large investment projects are anticipated for communication and financial sectors.

(2) Case Study Analysis of Foreign Firms Operating in Estonia

The study team interviewed five foreign firms operating in Estonia, under the assistance of the Ministry of Economy and the Estonia Investment Agency, and visited their factories. Based on the results of the interview surveys, major characteristics of foreign firms in the country are summarized as follows.

General profiles

General profiles of the foreign firms interviewed are summarized below.

Table 11.5.4 List of Foreign Firms Interviewed

Name	Country	Industry	Employment	Revenues
A	U.S.A.	Benzoic acid-based chemical materials	115	N/A
B	Denmark	Shipbuilding	820	USD14 million
C	Singapore	Cotton fibers and fabrics	735	USD23 million (estimated for 2000)
D	Afghanistan	Dairy products	165	USD21 million
E	Singapore	Kraft and tissue paper	575	USD21 million

Source: Interview surveys

Role of Estonian operation and major markets

All of the foreign firms surveyed are serving foreign markets, including the EU, the U.S., Asia and Africa. Notably, they are highly valued by foreign partners for high levels of technology inherited from the former Soviet era. As seen in the case of B company which is responsible for manufacture of components of ships used by the parent company in Denmark, foreign manufacturers seem to find the country's parts production capability attractive, allowing them to take advantage of low-cost labor and high technical skills. The country also serves as the supplier base in the electrical and electronics sector.

Table 11.5.5 Role of Foreign Firms Operating in Estonia and Major Markets

Company name	Function	Major markets
A	Local headquarters	EU 55% (including Germany, U.K., the Netherlands), U.S. 30%, Asia and other regions 15%
B	Local headquarters	Denmark 95% and others 5%
C	Local headquarters	Italy 22%, Finland 20%, U.K. 15%, France 9%, Germany 8% and others 26%
D	Headquarters	France 50%, Estonia 30%, Others 20% (Asia, Africa, Central Asia, etc.)
E	Local headquarters	EU and U.S. 47%, Asia 29%, Africa 5% and others 19%

Background and reason for investment

Unlike Lithuania and Latvia, no foreign firms interviewed selected Estonia as their base of operation for the purpose of targeting the Baltic States and the CIS countries. Many of them have received foreign investment in the privatization process because of high levels of production facilities and equipment as well as low-cost workforce.

As some firms cite good logistics as a reason for investment, the Baltic States seem to compete fairly in terms of logistical advantage in relation to the EU and other markets.

Table 11.5.6 Background and Reason for Investment

Company name	Objective	Reason for investment
A	Expansion of production function	Privatization Low-cost labor force High quality products
B	Expansion of production function	Privatization Low-cost labor force
C	Market expansion Expansion of production function	Privatization Government' s quick response and appropriate action Good logistics
D	New business development	Abundant and high quality raw materials
E	Market expansion Expansion of production function	Government' s quick response and appropriate action Good logistics Low-cost labor force

Source: Interview surveys

Major issues facing foreign firms and a future outlook for the business environment

No respondent cited a major problem. Nevertheless, there are a number of issues related to business management, including taxation, the lack of awareness of group performance, and language problems in rural regions (lack of English language skills). Some pointed out that foreign firms have overcome the major issues facing the first stage (business startup) and are required to meet challenges in the subsequent stage (business expansion and efficiency improvement). No respondent felt any administrative barrier to their business operation, making a sharp contrast to Lithuania.

As seen in Lithuania and Latvia, all the respondents expect the better business environment in the future. With the recovery of the EU market and the foregone financial crisis in Russia, they are willing to expand business, and many make capital investment to upgrade capacity.

Table 11.5.7 Current Issues Facing Foreign Firms and Their Future Outlook for the Business Environment

Name	Major issues	Outlook for the future business environment
A	High tax rates on corporate education, training and entertainment expenses Shortage of people who can speak English in rural regions	Getting better (already installed new equipment)
B	Lack of interest in corporate management among workers Poor sense of responsibility for group performance	Getting better Increased price competition in export markets
C	Rise in energy cost (not anticipated at the initial stage of operation)	Getting better (already installed new equipment)
D	Competition with companies from the Netherlands, Finland, the U.K. and other EU countries	Getting better (already installed new equipment)
E	Shortages of middle management and engineering staff	Getting better (First expansion plan was implemented in 1998 and the second expansion plan is scheduled in 2001)

(Source) Interview surveys

Strengths (advantages) and weaknesses (disadvantages) of Estonia as place of investment

Major strengths of Estonia cited by the survey respondents are as follows:

- Availability of low-cost and highly skilled labor force and competent engineers

- Efficient government service
- Strategic geographical location bridging the CIS and the EU
- Absence of corporate income tax
- Ease of procurement of raw materials
- Stable currency

Unlike Lithuania, some respondents cite “government’ s quick response” as the country’ s strength. Although the survey size is not large enough to make a conclusive generalization, the study team was impressed by a positive attitude of an officer of the Ministry of Economy, who accompanied the study team and asked the respondents to see if they had any problems and requested a written report to the government, if any, while promising quick response and action.

On the other hand, the following weaknesses were also cited.

- Low standards of living in rural regions
- Shortages of middle management and engineering staff
- High financial cost
- Shortage of vocational training facilities
- Rise in electricity charge

Compared to Lithuania, there were few complaints about government service in terms of response and efficiency.

Table 11.5.8 Strengths (Advantages) and Weaknesses (Disadvantages) of Estonia for Foreign Investment

Name	Strengths (advantages)	Weaknesses (disadvantages)
A	<p>Absence of corporate income tax</p> <p>Low-cost labor force (one sixth the wage rate in the U.S.)</p> <p>Abundant supply of highly skilled workers</p> <p>Workers with willingness to learn new work or technique (more adaptive than workers in the U.K. and France)</p> <p>Willingness to improve quality and productivity</p> <p>The strategic location between the EU and the CIS</p> <p>Efficient government service</p>	<p>Low standards of living and medical service (for foreign firms)</p> <p>Shortage of people who have sufficient English language skills</p> <p>Rise in electricity charge</p>
B	<p>Low-cost and highly educated labor force</p>	<p>Shortage of middle management staff</p> <p>Lack of responsibility for group performance</p>
C	<p>Good access to raw materials (cotton imported from Central Asia, via Riga)</p> <p>Abundant supply of skilled workforce</p> <p>Stable currency</p> <p>Proximity to the EU market</p> <p>Efficient government service</p>	<p>Shortage of textile-related vocation training facilities</p>
D	<p>Abundant, high quality raw materials</p> <p>Large dairy product export quota to the EU, much higher than the present capacity</p>	<p>High capital cost (interest rate ranging between 12 – 14%, 18% at maximum)</p> <p>Seasonal fluctuation of the dairy product market</p>
E	<p>Good access to raw materials</p> <p>Low-cost, highly skilled workforce</p> <p>Stable currency</p> <p>Proximity to the EU market</p> <p>Efficient government service</p>	<p>Shortage of middle management staff</p> <p>Shortage of engineers</p> <p>Shortage of vocational training facilities in the wood processing field</p>

Source: Interview surveys

11.6 Business Environments in the Baltic States as Perceived by Foreign Firms

(1) Major differences among the three countries

Various reports, including those mentioned earlier, rate the Baltic States by the level of progress of market economy, in order of Estonia, Latvia and Lithuania. According to the foreign firms interviewed, problems facing those operating in Estonia vary from one firm to another. In Latvia, government service is still a source of complaint among some firms but is quickly improving. In contrast, inefficient government service is cited by many firms in Lithuania.

(2) Common elements

Advantages commonly found in the Baltic States include: (1) low labor and operating costs; (2) geographical proximity to the EU; (3) a strategic location bridging the EU and the CIS; and (4) abundant raw materials. Nevertheless, evaluation of these factors in investment decision varies with business models and styles, and they must be carefully analyzed for each business in terms of level of contribution.

11.7 Competitive Analysis of the Baltic States

The active move made by Lithuania to attract foreign firms is also seen in neighboring countries along the Baltic Sea, namely Latvia, Estonia. In fact, these countries are in the process of adapting their institutions and systems to those acceptable to the EU by setting it as their policy objectives. As a result, institutional barriers to foreign investment are quickly disappearing in these countries.

Similarly, the comparative advantages of Lithuania for foreign investment, as discussed earlier, are not unique to the country alone. In fact, they are more or less shared by neighboring countries. It is therefore important to ascertain the country's strengths and weaknesses accurately relative to neighboring countries. Based on the in-depth competitive analysis, the present institutions and systems related to foreign investment should be reviewed and modified from the viewpoint of making the proposed project, as implemented in Lithuania, relatively viable compared to neighboring countries. Furthermore, the project is not intended for unknown investors, as seen in portfolio investment or promotion of an industrial estate. Instead, it is to attract strategic investors and its preparation process must produce a prospectus acceptable to such investors, rather than a standard brochure emphasizing the general investment climate of the country. Accordingly, this viewpoint should be fully reflected in the foreign investment promotion plan. In particular, plans to build pulp mills in Estonia and Latvia were announced this year and the proposed project is facing the increasingly competitive environment. Bearing these circumstances in mind, this report evaluates the investment climates of Lithuania, Latvia and Estonia, especially focusing on strengths and weaknesses of Lithuania, and identifies incentives and other conditions that should be offered by the country to attract the strategic investor.

(1) General evaluation by external rating organizations

Today, countries are rated by various organizations to measure their investment climate on a comparable basis by using specially coined indices such as investment worthiness and business environment. Companies who intend to start foreign operations select prospective countries on the basis of information available from these sources, in addition to the analysis of macroeconomic trends.

1) Positioning by government bond rating

Ratings of foreign currency-denominated government bonds can be used as one of key indicators to determine investment worthiness. The ratings are made by independent research services, such as Standard & Poors, Moody' s and Fitch IBCA, each of which publishes the quality of investment by using unique indicators and symbols. The ratings essentially indicate the ability of each government to repay debts and risks involved. While they are primarily intended for and used by investors. they provide important information representing each country' s current status in terms of creditworthiness and are useful for firms who consider overseas investment.

The following table shows bond ratings of developing countries in Europe, the CIS and Asia. Lithuania is generally rated at the medium level in terms of quality of investment, its ratings are lower than those for Estonia and Latvia and same as Thailand which triggered the Asian currency crisis. As discussed later, most publications comparing investing worthiness of the three countries rank Estonia, Latvia and Lithuania in that order.

Table 11.7.1 Summary Table of Government Bond Ratings

Name	S&P	Moody' s	FitchIBCA
Lithuania	BBB-	Ba1	BB+
Latvia	BBB	Baa2	BBB
Estonia	BBB+	Baa1	BBB
Czech	A-	Baa1	BBB+
Slovakia	BB+	Ba1	BB+
Hungary	BBB	Baa1	BBB+
Poland	BBB	Baa1	BBB+
Slovenia	A	A3	A
Croatia	BBB-	Baa3	BB+
Romania	B-	B3	B-
Bulgaria	B	B2	B+
The Philippines	BB+	Ba1	BB+
Thailand	BBB-	Ba1	BBB-
Malaysia	BBB	Baa3	BBB

(Source) Publications in December 1999

2) Country rankings

In addition to the ratings, several publications rank countries in their investment worthiness.

International business magazines such as Institutional Investors and Euro Money publish the rankings on a periodical or non-periodical basis. In the rankings by Institutional Investors and Euro Money, Switzerland and Luxembourg ranked first. Lithuania ranked 66th and 65th respectively, compared to Latvia (62nd and 62nd) and Estonia (51st and 52nd). Although the differences are not of much significance, the fact that Lithuania ranked below the other Baltic States may be related to their overall investment worthiness.

Table 11.7.2 Country Rankings (Developing Countries in Europe, the CIS and Asia)

Name	Institutional Investors-rank	Euro Money-rank
Lithuania	66	65
Latvia	62	62
Estonia	51	52
Czech	30	45
Slovakia	61	64
Hungary	35	39
Poland	34	42
Slovenia	28	33
Croatia	64	57
Romania	85	95
Bulgaria	79	89
The Philippines	50	51
Thailand	47	47
Malaysia	43	46

(Source) Publications in September 1999

Finally, according to the Wall Street Journal's country rankings by economists (covering 27 Central/East European, CIS and Baltic countries), Lithuania ranks seventh, although it is still behind Estonia (fifth) and Latvia (sixth). On an item basis, the country is highly valued for liquidity, while poorly rated in macroeconomic areas such as the international balance of payments. On the other hand, Estonia received high ratings for price stability (second place), business ethics (third), investment climate (third) and political stability (third).

As seen in the ratings, the country rankings also place Lithuania at the lowest among the Baltic States, following Estonia and Latvia. As these ratings and rankings are not entirely based on purely quantitative, economic data, it suggests the need for active promotion of Lithuania to the outside world, particularly its comparative advantages for foreign direct investment, which would help improve its evaluation compared to the neighboring countries.

Table 11.7.3 Rankings by Economists

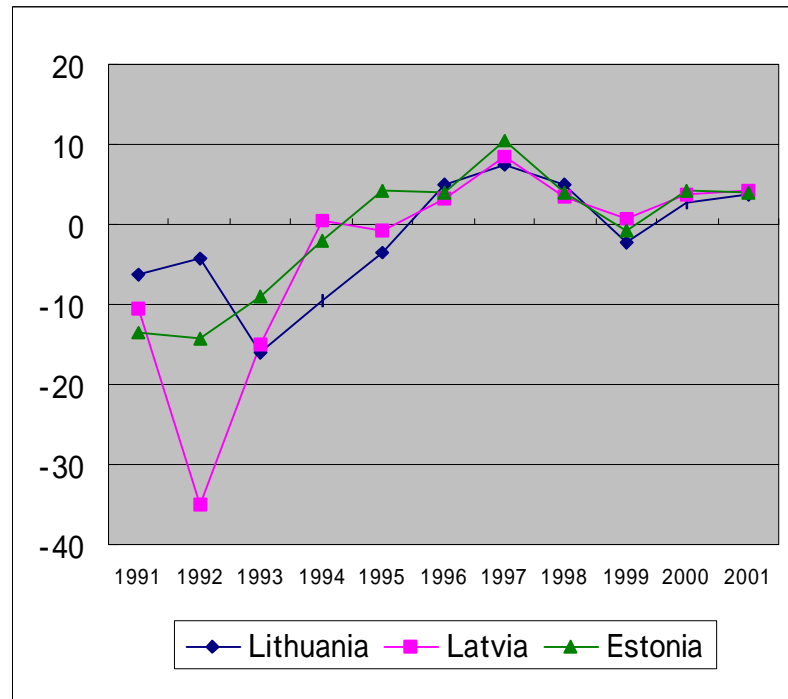
	Lithuania	Latvia	Estonia
Total Rank	7	6	5
Economic Strength	7	6	4
Balance of Payment	14	11	9
Business Ethics	6	6	3
Integration into World Economy	7	8	4
Liquidity/Ease of Buying Stocks	5	7	4
Rule of Law	6	6	4
Price Stability	6	3	2
Productivity	8	6	4
Currency Stability/Investment Climate	6	6	3
Political Stability	7	5	3

(Source) The Wall Street Journal Europe, December 1999, “Central European Economic Review”

(2) Industrial and economic evaluation

The Baltic States underwent economic downturns up to the mid-1990s due to economic turmoil after their independence, including hyperinflation, and structural changes in the regional economy. Then, the Estonian economy returned to a growth path in 1995, followed by Lithuania and Latvia in 1996. This indicated clear signs of successful shift to a market economy. The Russian currency crisis in 1998, however, widened a gap between Lithuania and other two countries.

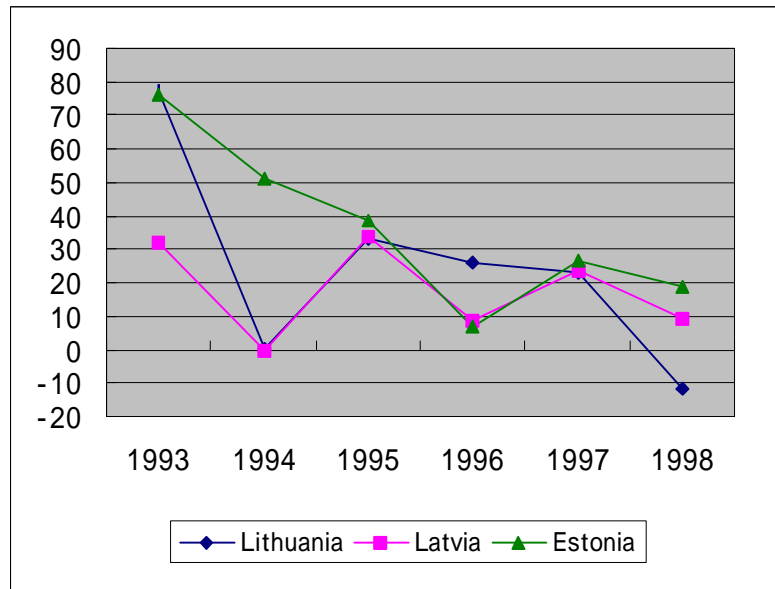
Figure 11.7.1 Real GDP Growth Rates



(Source) EBRD data up to 1997, and Nomura Research Institute after 1998

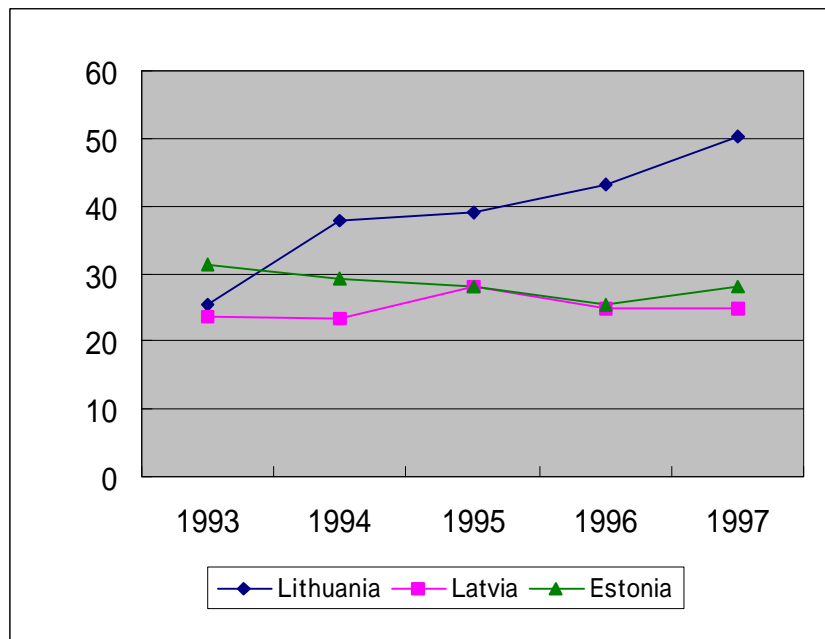
Comparison of the three countries on the basis of selected economic indicators, such as growth rate, the current account, and government finance, reveals that the trade structure is one of major differences distinguishing the three countries. Although they equally increased exports after their independence, exports by Lithuania declined rapidly in 1998 due to the Russian currency crisis. In that year, exports recorded negative growth for the first time after independence. In contrast, Estonia and Latvia boosted exports by 19% and 9% respectively.

Figure 11.7.2 Export Growth Trends (Over Previous Year)



(Source) EBRD data

Figure 11.7.3 Exports to Former Socialist Economies (Percentage Share of Total)



(Source) EBRD data

Characteristically, major export markets for Estonia and Latvia are market economies, accounting for 72% and 75% of total exports, respectively, while Lithuania's exports to market economies represent only 50%. Accordingly,

exports to Russia accounted for 25% in 1997, before the Russian crisis, compared to Estonia 19% and Latvia 21%. This reflects the fact that Estonia and Latvia swiftly shifted their exports to the EU and other stable markets, whereas Lithuania expanded exports to former socialist states that were in transition to a market economy. As Lithuania maintains close ties with the CIS countries including business relationships, it is viewed by many foreign firms as a strategic base to serve the CIS markets as indicated in the results of the interview surveys. No matter how large potential markets Russia and the CIS countries are, however, establishing the effective link with the stable, gigantic market in the EU is sure to determine a future outlook for the Lithuanian economy. Estonia and Latvia have small domestic markets, but it does not make the two countries less attractive as export bases for the EU. They have been boosting exports to the EU as well as Scandinavian countries by focusing on resource-based products, such as wood and textile, and labor-intensive ones using low-cost, highly skilled work force. This is a feasible strategy for Lithuania. The important point is to diversify and stabilize the country's trade structure by fostering these export industries and/or attracting foreign firms who can enjoy the advantages offered by the country.

(3) Evaluation of financial and foreign exchange systems

There is no significant difference among the three countries in terms of external debts and foreign currency reserves as percentage of GDP, which are not particularly healthy figures. A major difference is seen in foreign exchange policy. While Estonia links its currency to the Deutsche mark and Latvia to SDR, Lithuania pegs Litas to the U.S. dollar. Clearly, pegging to the Euro is preferable if EU exports are to be expanded. It was hotly discussed last year in Lithuania, but the decision was postponed until 2001. As the Euro has been mostly weak against the dollar, Lithuania loses price competitiveness in its major potential market. On the other hand, Estonia and Latvia faced devaluation of local currencies against the dollar by around 30% and 6%, respectively, between 1996 and 1999, due to their pegging to the mark and SDR. As Lithuania holds a risk of current devaluation in the near future due to a deficit in the current account, it is by no means good time for foreign companies to invest in the country. However, it is time to consider investment a few years later.

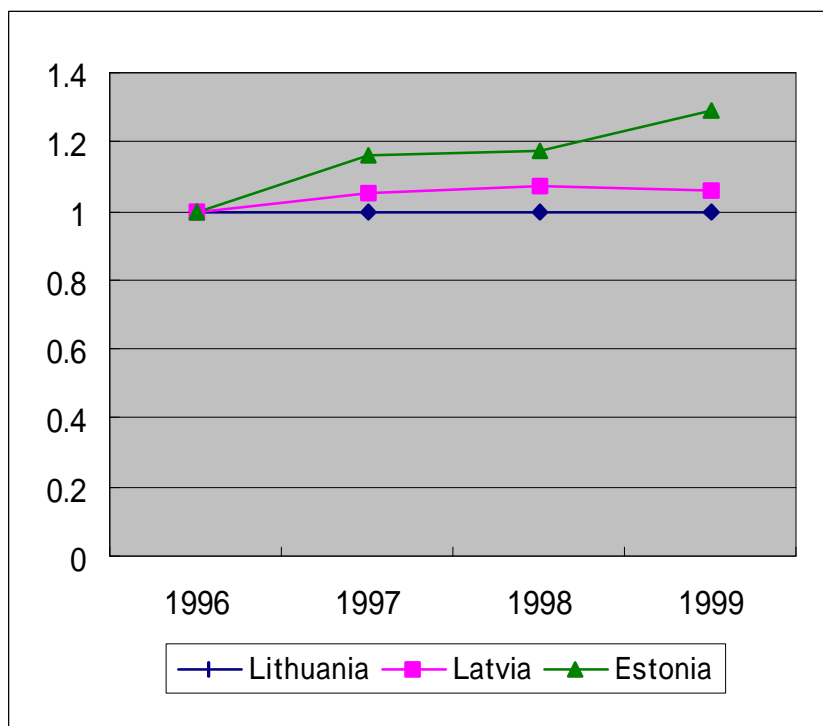
Meanwhile, the Lithuanian economy reportedly improved in the first quarter of 2000 as it recovered from the Russian financial crisis, with some improvement in the current account balance and increased exports to the EU. As foreign currency reserves are maintained at a sufficient level and the currency board has been taking effective action, economic experts in Lithuania are now expecting a small possibility of the currency problems.

Table 11.7.4 Currency Exchange Rates of the Baltic States

Country	Pegged currency
Lithuania	1USD=4LTL
Latvia	1SDR=0.7997LVL K
Estonia	1DM=8EEK

(Source) Various publications

Figure 11.7.4 Recent Changes in Exchange Rate Against the U.S. Dollar (Indexed when 1996 = 1)



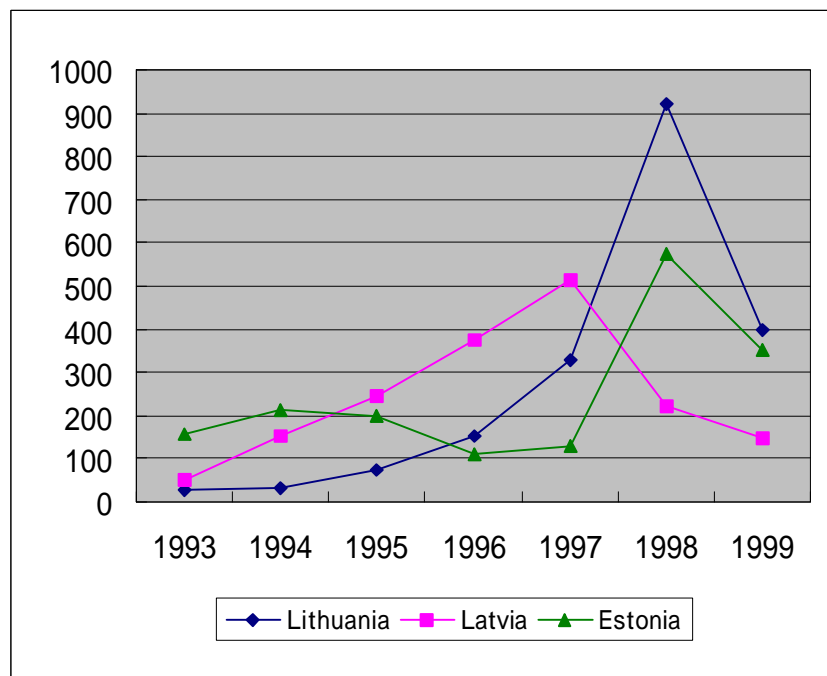
(Source) Nomura Research Institute

(4) Evaluation of direct investment

Net direct investment in Lithuania has been growing rapidly in recent years. Since 1996, the flow of foreign investment has been shifted from Estonia and

Latvia to Lithuania. This partly reflects the fact that the country was slow in working with privatization and building infrastructure to attract foreign investment. In particular, the country has been slow in promotional efforts because it might not feel the need for self-advertisement as it was a relatively large country in the region. In contrast, the fact that Estonia and Latvia receive relatively large amounts of direct investment per capita indicates several important clues for Lithuania to learn from their success. As pointed out earlier, foreign firms investing in these countries do not intend to serve the domestic markets. Given the similar locational advantages they have in comparison to Lithuania, they have effectively promoted their countries to foreign firms. In addition, it is important to be located next to relatively large economies with good appetite for investment, e.g., Finland for Estonia and Germany for Czech. Lithuania was late for promoting itself effectively because it was lagged behind other Baltic States in making their institutions and systems ready to receive foreign investment.

Figure 11.7.5 Recent Changes in Net Foreign Direct Investment in the Baltic States



(Source) EBRD data

Table 11.7.5 Aggregate Amount of Direct Investment Per Capita in Central and East European Countries (Up to 1998)

Country	Aggregate investment per capita
Hungary	1,783
Czech	1,307
Estonia	1,194
Latvia	731
Slovenia	701
Croatia	606
Poland	557
Lithuania	523
Slovakia	419
Romania	263

(Source) Various publications(5) Evaluation of institutional reforms and other initiatives to transform to market economy

The major incentive for Central and East European countries and the Baltic States in their efforts to work with institutional reforms is that they lead to the membership in the EU and the WTO. Development of adequate economic and social institutions and systems is a major hurdle for these countries to join the important organizations. Estonia is expected to be included in the First Wave (five countries) of the EU membership, together with Czech, Hungary and Poland

Then, Latvia and Lithuania were expected to be included in the Second Wave (five countries). However, the EU has recently changed its policy for new membership and is considering simultaneous participation of countries in the First and Second Waves.

As for WTO membership, Latvia joined in February 1999 and Estonia in November 1999, while Lithuania is negotiating for early acceptance. While some agricultural issues remained to be resolved, membership will be obtained in 2001 or 2002.

Thus, the immediate prospect for participation in these international organizations is another indicative of Lithuania's steady progress in institutional reforms.

Nevertheless, EBRD's evaluation on transformation to market economy indicates that reforms in Lithuania are slower than those in Estonia and Latvia and indicates the need for Lithuania to accelerate its efforts to modernize its policymaking and implementation institutions. Responses of foreign firms operating in the country to the interview survey support this argument.

Table 11.7.6 EBRD' s Evaluation on Progress of Transformation to Market Economy

	Lithuania	Latvia	Estonia	Czech	Hungary	Poland
Private sector' s share	70	65	75	80	80	65
Corporate sector						
Major privatization	3	3	4	4	4	3+
Minor privatization	4+	4	4+	4+	4+	4+
Progress of restructuring	3-	3-	3	3	3+	3
Market and trade						
Price liberalization	3	3	3	3	3+	3+
Trade and foreign exchange	4	4+	4	4+	4+	4+
Competition policy	2+	3-	3-	3	3	3
Financial institutions						
Bank reforms and liberalization of interest rates	3	3	4-	3+	4	3+
Securities markets and non-bank financial companies	3-	2+	3	3	3+	3+
Legal system						
Degree of progress	3-	3	4	3	4	4
Efficiency	2	2	3+	2+	4	4
Overall evaluation	3-	3-	4-	3	4	4

(Source) EBRD data

(5) Geographic and social evaluation

The Baltic States are relatively small countries in terms of land area and population. Lithuania, the largest among the three, has only 3.7 million population. The total land area of the three countries is 175,000Km², less than one half that of Japan. While their economic status, such as GDP per capita, is still low from the world standard, they boast high levels of education and sophisticated culture. Furthermore, Lithuania is said to be politically stable compared to other two countries because ethnic Lithuanians account for a majority of the population.

Table 11.7.7 Basic Data

	Lithuania	Latvia	Estonia
Land area (ten thousand Km ²)	6.5	6.5	4.5
Population (million)	3.7	2.6	1.5
Ethnic composition (percentage of native race)	81.0	56.0	65.0
Percentage completing primary education	93.0	83.0	84.0
Percentage of enrollment in secondary education	39.0	17.0	38.0

(Source) Publications and literatures available to the study team

(6) Business-related costs

There is no significant difference in most business-related costs among the three countries, with the percentage difference being less than 10%. A few cost items showing a notable difference are the average wage in the manufacturing sector and water supply and sewerage costs, which are particularly high in Estonia, and the gas price which is very low in Latvia. It should be noted, however, that these costs likely vary within each country and detailed surveys will be important to estimate accurate costs in relevant areas.

Table 11.7.8 Comparison of Major Cost Indices in the Baltic States (1999)

	Lithuania	Latvia	Estonia
Average wage (USD/month)	291(100)	264(91)	279(96)
Average wage in the manufacturing sector	247(100)	229(93)	322(130)
Water supply charge (portable, USD/m ³)	0.8(100)	0.63(79)	0.98(123)
Sewage charge (office, USD/m ³)	0.6(100)	0.63(105)	0.98(163)
Gas charge (USD/m ³)	0.3(100)	0.1(33)	0.26(87)
Electricity charge (USD/kWh)	0.03-0.08(100)	0.05-0.06(111)	0.01-0.05(55)
Fuel (USD/litter)	0.63(100)	0.7(111)	0.59(93)
Rent of high-grade apartment in capital (USD/m ² /month)	8-14(100)	10-12(100)	8-11(86)

(Source) Lithuanian and Estonian governments

(7) Taxation

The taxation system has been continuously changed with the progress of institutional reforms. In particular, the three countries have recently lowered their corporate income tax rates in order to compete with other countries in attracting foreign firms. In fact, some foreign firms who responded to the interview survey cited tax incentives as a major factor for investment decision. Tax incentives in Lithuania were significantly changed in 1997. At the same time, the tax relief measures on corporate income tax, as applied thereto, were terminated. Under the new program, foreign firms which have invested USD50million and satisfied specific conditions are designated as the strategic investor and become eligible for various incentive measures.

In Estonia, the corporate income tax rate was reduced to zero in 2000.

These tax incentive measures are to be discussed in the context of the EU participation, and the government intends to negotiate as a special exception.

Table 11.7.9 Comparison of tax system in the Baltic states

(Unit: %)

	Lithuania	Latvia	Estonia
Corporate Income Tax Rate	24	25	0
Withholding Tax Rate			
Dividends	29	10	0-26
Interest	15	5-10	10-26
Royalties	10	10	5-15
Non-resident company for consulting	15	10	15
Individual Income Tax	33	25	26
Social Security Tax			
Employer	31	28.09	33
Employee	3	9	-
Value Added Tax	18	18	18
Excise Tax			
Natural Resource Tax			
Pollution Tax			
Road Tax	0.1-1.0	×	×
Land Tax	1.5	1.5	0.5-2
Property Tax	1	0.5-4	×
Special incentives including Special Economic Zone	Incentives for Special Economic Zone For investment exceeding USD1 million, the corporate income tax is exempted for the initial five years and 50% reduction is granted for the subsequent ten years. For investment less than USD1 million, 80% reduction of the corporate income tax is applied for the first five years, followed by 50% reduction in the additional five years, plus exemption of VAT, customs duties, road tax, real estate tax and/or withholding tax.	Incentives for Special Economic Zone Refunding of land and property taxes (80-100%), accelerated depreciation up to 100%, carryover of operating loss over 10 years, refunding of corporate income tax up to 80%, refunding of withholding tax up to 80%, exemption of withholding tax, and/or exemption of customs duties.	Exemption from VAT in the special economic zone
Others	Capital investment incentives	Hightech incentive	

(Sources) Lithuanian, Latvian and Estonian government

(8) Comparison of the existing institutions and systems to attract foreign investment in the Baltic States

As discussed earlier, Lithuania and neighboring countries have been developing the institutions and systems required to induce foreign investment, including the establishment of a specialized organization responsible for investment promotion. Lithuania has established the Lithuania Development Agency (LDA), which has the following missions: (1) to conduct promotional and other activities to attract foreign investment; (2) to create a positive image of Lithuania in the international community as a reliable business partner; (3) to promote exports from the country; and (4) to represent the interest of domestic and foreign firms and make requests for improvement to the government. Latvia and Estonia also have similar organizations, namely LAA and EIA respectively.

Also, the countries have signed bilateral and multilateral treaties related to the encouragement and protection of foreign investment, totaling 28 countries as of March 1998. They also have entered into an agreement on double taxation with 20 countries, and additional 10 or more by 2000. The three countries work together to conclude and maintain these arrangements.

While the countries are enthusiastically welcoming foreign investment, there are some potential disincentives for foreign firms. For instance, Lithuania sets protection of the natural environment as a priority issue and imposes the pollution tax that is assessed on the basis of quantity and type of environmental load, such as sewage, exhaust gas, and solid waste. The pollution tax is collected by the central or local government and a special organization (such as a sewerage district). As penalties are added to the overdue tax and environmental discharges exceeding the specific standards, it is important to estimate environmental costs accurately, including pollution control measures to be required. Note that the Baltic States are reportedly imposing similar environmental regulations and measures.

Also, high export tariffs are imposed on products which use or are made from scarce local resources or which are highly demanded for domestic consumption. For instance, the 50% tariff is applied to raw oak and ash, and 30% to leather

products. As for imports, food products are subject to a higher tariff rate of 13% for protection of domestic industries, compared to the average rate of 5%.

Based on the above analysis, the three countries are compared for the following areas: (1) legal infrastructure related to foreign investment; (2) a negative list; (3) incentives (such as FEZ); (4) the organization to promote foreign investment; and (5) administrative procedures required for direct investment by foreign firms.

Table 11.7.10 Comparison of the Existing Institutions and Systems Related to Promotion of Foreign Investment

	Lithuania	Latvia	Estonia
Legal infrastructure	Foreign Capital Investment Law	Foreign Investment Law	Foreign Investment Law
Negative list	Those related to gambling, the use or production of dangerous substances, etc.	Ditto	Ditto
Incentives	Tax incentives (corporate income, tariff, etc.) for FEZ and others Strategic Investors	Tax incentives (corporate income, tariff, etc.) for FEZ and others	Tax incentives (corporate income, tariff, etc.) for FEZ and others
Promotional organization	LDA	LAA	EIA
Administrative procedures for foreign investment	Cumbersome (especially land and buildings)	Quickly improved	Simplified
Others	Many complaints about administrative procedures as well as inspection and testing services	Some complaint about taxation	Few complaints about the government's response and action

Sources) Various publications

In addition, it is important for foreign firms that incentives are presented according to the stage of investment and operation. Thus, evaluation is made for the following areas that are divided according to key activity required by foreign investors: (1) feasibility study; (2) approval and licensing procedures for direct investment, the establishment of a corporation, and incentives; (3)

approval procedures for site development and construction; (4) selection of contractors; (5) procurement of construction materials; (6) construction; (7) hiring of work force; (8) securing of raw materials and energies; (9) production; (10) storage; (11) sales and exporting; (12) transportation; (13) financing, collection and payment; (14) fund transfer; and (15) additional investment.

Table 11.7.11 Comparison of current status of business factors in the Baltic states

	Lithuania	Latvia	Estonia
Feasibility study	Support by LDA and others	Support by LAA and others	Support by EIA and others
Approval and licensing procedures	Pace of improvement is slow	Quickly improved	No problem
Approval procedures for site development	Pace of improvement is slow	Quickly improved	No problem
Selection of contractors	No problem	No problem	No problem
Procurement of construction materials	No problem	No problem	No problem
Construction	No problem	No problem	No problem
Hiring of work force	No problem	No problem	No problem
Securing of raw materials and energies	Procurement of wood holds key	Procurement of wood holds key	Procurement of wood holds key
Water supply/sewerage	Depending on location	Depending on location	Depending on location
Production	No problem	No problem	No problem
Storage	No problem	No problem	No problem
Sales and exporting	No problem	No problem	No problem
Transportation	No problem	No problem	No problem
Financing, collection and payment	Poor service related to domestic financing (service is improved as foreign financial institutions have started service)	Good financial service	Good financial service
Fund transfer	No problem	No problem	No problem
Others			

Notice: No problem means that a company can cope with items rather easily.

Source: interview surveys.

11.8 SWOT

(Strength/Weakness/Opportunity/Threat) Analysis of Lithuania

(1) Strengths

Based on the above evaluation and analysis, the country' s major strengths are identified as follows.

Geographical location

- Strategic location bridging the EU and the CIS

(Implications on the project)

As the proposed project will not likely target the CIS as its key market, good access to the EU market should be emphasized and demonstrated visually in promotional materials.

Labor force

- Highly skilled, low-cost and abundant labor supply
- Few labor disputes
- High levels of university education

(Implications on the project)

These advantages appear to exist in the three countries with little difference. Instead, labor advantages over industrialized countries should be appealed to foreign firms.

Infrastructure

- Well-developed transportation networks (particularly roads)

(Implications on the project)

Good access from the project site to raw material sources, the EU and Klaipeda Port should be visually presented using a map showing well-developed networks.

Cost factor

- Low operation and living costs

(Implications on the project)

These advantages appear to exist in the three countries with little difference. Instead, cost advantages over industrialized countries should be appealed to foreign firms.

Social stability

- Racial harmony, political stability and good relations with Russia

(Implications on the project)

Social stability should be emphasized as a great achievement after independence.

Abundant raw materials

(Implications on the project)

As the proposed project requires sufficient supply of wood and water, it is imperative to provide the best conditions for wood supply compared to competing projects.

(2) Weaknesses

The following weaknesses were identified from the above evaluation and analysis.

Government service

- The interview surveys revealed that foreign firms complained about slow and inefficient government services, complicated procedures, frequent changes in systems without instruction or advice, and complicated administrative procedures related to foreign investment and its approval.
- The World Bank's report also pointed out many problems related to public service, including poor levels of field service.
- These indicate that field organizations and their service quality have still to be improved.

(Implications on the project)

For many countries, attraction of foreign firms and their investment is one of the most important industrial policies. To promote the country effectively to potential investors, a feasible solution is to provide integrated service for foreign firms through a designated organization, as seen in "One Stop Service" provided by South Korea. In particular, for a project which involves two or more ministries and covers several areas (administrative units), it is imperative to establish a primary contact at the central government level.

In particular, it is important to provide consistent communication and response to the issues related to land acquisition, procurement of wood materials, and environmental protection including wastewater treatment and discharge.

Institutional reform

- It is pointed out that the reforms in the Baltic States have progressed at a slower pace than expected.

(Implications on the project)

The proposed project will likely be affected by problems related to day-to-day government service, rather than those related to policymaking and implementation.

Business service

- Difficulties in domestic financing and various business-related services, and poor education and public health systems in rural area

(Implications on the project)

Major issues related to financial service should be identified through financial planning for the proposed project. Also, the project plan should cover critical business services, such as maintenance and security.

Industrial economy

- Comparatively high economic dependency on Russia and the small domestic market were pointed out.

(Implications on the project)

While these factors are not directly related to the proposed project, transformation of industrial structure is critical for overall economic growth and the project should contribute to the goal.

Financial policy

- There are some concerns about the devaluation of Litas in the near future, but economic experts in Lithuania rule out the possibility in consideration of the sufficiently high level of foreign currency reserves and good management by the currency board.

(Implications on the project)

As the foreign exchange situation is considered to work against price competitiveness in the EU market, it will also directly affect the proposed project. The currency will be pegged to the Euro in 2001.

(3) Opportunities

The proposed project is expected to capitalize on the following opportunities:

- Upturns of the pulp market

- Move toward consolidation and alliance among multinationals

- Expansion of the EU and long-term growth prospects

- The subsided Russian currency crisis

(Implications on the project)

These changes in the business environment affect all the Baltic States, Central and Eastern Europe, and the CIS, and it is important to respond to them quickly and in a timely manner.

(4) Threats

Major threats to the proposed project in its implementation stage are summarized as follows:

- Intensified competition with other Baltic States, Central and East European countries which will step up their efforts to attract foreign direct investment

- Supposed instability of the foreign exchange system (compensated for by favorable conditions, such as effectiveness of the currency board, the change to the Euro-pegged system in 2001, and the improved current account balance)

- Rise in environmental concern and reactionary, excessive regulatory control

- Procurement of wood materials on a stable basis through a nascent market mechanism

(Implications on the project)

As for the first threat, the more effective and aggressive promotion is required to overwhelm other countries. The second threat has to be dealt with by the government within the framework of financial policy. The third threat must be mitigated by introducing latest technology and demonstrating its small environmental impacts. Finally, the fourth threat should be addressed by securing the government's commitment to the project and stable supply of wood materials.

11.9 Questionnaire Survey of Potential Investors: Result and Analysis

The study team conducted a questionnaire survey of around 300 paper and pulp companies to ask about their interest in this project and find out the key successful factors for the project. The survey was conducted before the proposed mill plan was decided by sending a simplified form of questionnaire (questions shown below) to senior managers.

The questionnaire was designed jointly with the Lithuania Development Agency (LDA) and sent under the name of the LDA's manager in charge of investment by facsimile or e-mail.

Questions in the questionnaire:

- General interest in Lithuania as a place of investment;
- A future outlook for pulp and paper demand as industrial materials;
- A need for new pulp mill construction to meet future requirements for raw materials;
- A need for new pulp mill construction to produce market pulp and paper in the future;
- Major factors for making mill construction decision; and
- Interest in obtaining a report on this project.

To this date, seven companies responded, two Italian, one Swedish, one Finnish, one German, one Austrian and one Spanish.

Their responses are summarized as follows.

- Six respondents expressed general interest in Lithuania as a place of investment.
- Five expect growing pulp and paper demand in the future.
- Three feel the need for mill construction to secure raw materials.
- Three feel the need for mill construction to manufacture commercial pulp and paper products.
- Four wish to obtain the project report.

Respondents (although a limited number so far) show generally strong interest in Lithuania and pulp and paper business. Together with the supply and demand survey, the project attracts and will attract attention in Europe.

Major factors considered in deciding a mill construction project are summarized as follows.

- Four companies cited: (1) availability of wood resources; (2) low operating cost; and (3) transportation network.
- Three cited: (1) the country' s stability; and (2) currency stability.
- Two cited availability of water resources and effluent treatment service.
- One cited low wage.

No respondent cited geographical proximity to the market and tax incentives.

According to leading pulp and paper trading companies in Japan, availability of wood resources is of primary importance for any pulp mill projects; it is the prerequisite to investment decision. Also, tax incentives are considered to play a crucial role in attracting investment, as evidenced from the results of the interview surveys of foreign firms operating in Lithuania.

Table 11.9.1 Result of the questionnaire survey

Item	Italy (1)	Italy (2)	Sweden (1)	Finland (1)	Austria (1)	Spain (1)	Germany (1)	Total
General interest in Lithuania as a place of investment	Yes	Yes	Yes	Yes	Yes	None	Yes	Yes (6)
Future outlook for pulp and paper demand	Very good	Good	Good	Good	Good	Not good	N/A	Good (5)
Need for a new mill to secure raw materials	Yes	Yes	Yes	None	None	None	N/A	Yes (3)
Need for a new mill to manufacture commercial products	Yes (strongly felt)	None	Yes	Yes (distant future)	None	None	N/A	Yes (3)
Interest in a report on this project	Yes	Yes	Yes	None	Yes	N/A	N/A	Yes (4)
Key factors for mill construction								
Availability of wood resources	Yes		Yes	Yes		Yes		4
Availability of water resources/effluent treatment service		Yes			Yes			2
Low wage		Yes						1
Low operating cost	Yes			Yes	Yes	Yes		4
Transportation network	Yes	Yes		Yes	Yes			4
Proximity to the market								None
The country' s stability			Yes	Yes		Yes		3
Currency stability			Yes		Yes	Yes		3
Tax incentives								None

Sources) questionnaire survey

11.10 Major Characteristics of Pulp and Paper Making Business and Foreign Investment Promotion Measures

(1) Characteristic 1: Need for proximity to the source of raw materials

Pulp and paper making operations consume large amounts of wood and water resources, which availability holds therefore the key to success of the business.

Latvian and Estonian governments have announced to guarantee wood supply up to 40-50% of requirements for respective projects.

More precisely, Latvia offers the following supply package:

Annual requirements	: 3 million m ³
Supply guaranteed by government	: 1.2-1.4 million m ³
Supply from private forests	: 1.0 million m ³
Waste wood	: 0.1 million m ³
Other sources	: 0.5 – 0.7 million m ³
(Lumber exports	: 2.5 million m ³ in 1999)

The supply guarantee by the government may be made in the form of purchase agreement with the government, but it creates fluctuation of price and supply volume due to the country's transformation to a market economy. Instead, a more stable supply mechanism is being considered by contributing government-owned forests as assets of the pulp and paper company to be established. This equity participation will eliminate the land acquisition and wood purchase costs on the company side, while providing stable returns to the Latvian government in the form of dividend by foregoing revenues from land and lumber sales. As the arrangement means that the government will participate in a joint venture with foreign corporations, it must understand and adapt itself to modern corporate management. Note that the joint venture by the private enterprise and the government is doomed to failure if the government takes leadership and tries to manage the company as a government organization.

On the other hand, Estonia is trying to attract investment in six candidate sites by offering the government's supply guarantee of 40% or 1.1 million m³, a long-term contract (10 – 20 years) and price negotiation based on the market price. Also the government suggests that an opportunity for negotiation is opened for tariff exemption or reduction on imported equipment, and a broad

range of support including land acquisition, infrastructure development, employee education and training, and financial assistance.

In Lithuania, foreign firms are not allowed to acquire farmland, which must be leased on a long-term basis. Foreign firms often express complaints about administrative procedures related to land acquisition or leasing. It is now important to make progress in institutional reforms related to land acquisition and registration, which are said to be scheduled to complete by 2003.

An alternative approach is the forest management contract that is adopted for a pulp mill project of Mitsubishi Corporation in Alberta, Canada. The 20-year foreign management contract allows the paper mill to cut and use trees in return for specific prices and requires the company to maintain and manage the forest. According to a leading pulp and paper trading company in Japan, the pulp and paper project requires a large amount of initial investment and thus the government's supply guarantee is one of the basic requirements for investment decision.

Thus, one of the key success factors for this project is to offer the supply guarantee and a transparent price negotiation system based on the market price, which are more attractive than those offered by Latvia and Estonia.

- (2) Characteristic 2: Capital-intensive operation requiring incentives to ensure a higher rate of return on investment

The pulp and paper mill sometimes requires large-scale capital investment close to 100 billion yen. It must create scale of economies because technology is matured and products are not high value added.

Massive capital investment entails a relatively long period for startup of commercial operation, which increases fixed costs, and initial costs serve as a determinant factor for project viability. Investment incentives therefore play an important role in reducing initial costs and improving financial viability of the project. In fact, foreign firms who responded to the interview surveys highly valued tax incentives valid until April 1, 1997. These tax incentives are continued for FEZ.

Comparing the present tax incentives for Lithuania's FEZ and those for Latvia's SEZ reveals that the two programs offer similar tax incentives including the corporate income tax, except for the 10-year carryover of operating loss. While the proposed project is limited in site selection and is unlikely to select the FEZ, its large size requires tax incentives equivalent to those available in the FEZ. In this conjunction, additional or accelerated depreciation introduced in Latvia also work to improve the project cash flow and is an effective means to increase viability of the capital-intensive business like paper and pulp.

Also, the joint venture business model introduced in Latvia seems to be eligible for serious consideration.

Table 11.10.1 Tax Incentives for FEZ in Lithuania and Latvia

Tax Incentives for FEZ in Lithuania	Tax Incentives for FEZ in Latvia
For investment exceeding USD1 million, the corporate income tax is exempted for the initial five years and 50% reduction is applied for the subsequent ten years. For investment less than USD1 million, 80% reduction of the corporate income tax is applied for the first five years, followed by 50% reduction in the additional five years, plus exemption of VAT, customs duties, road tax, real estate tax and/or withholding tax.	Refunding of land and property taxes (80-100%), accelerated depreciation up to 100%, carryover of operating loss over 10 years, refunding of corporate income tax up to 80%, refunding of withholding tax up to 80%, exemption of withholding tax, and/or exemption of customs duties.

- (3) Characteristic 3: Unstable, matured industry requiring quick response to market conditions

While the pump market is on the way to recovery, the previous upward cycles accompanied the booming mill construction that led to the price decline and market downturns. Recently, large pulp mill projects have been announced in Estonia and Latvia. The project in Latvia is in the stage of feasibility study, which will be carried out by a company established in this April by the Latvian government and Finnish and Swedish companies. The study will be completed by the end of 2002. If the project progresses smoothly, it will affect the proposed project because the two firms participating in the Latvian project are market pulp manufacturers. Time is of essence for the Lithuanian project.

As it is desirable to include the above incentives in the prospectus for the project, in addition to the project outline, the government is expected to establish its integrated policy for investment promotion.

(4) Characteristic 4: Significant environmental impact requiring cooperation of local communities

As the pulp and paper industry creates the risks of producing water and/or air pollution, close cooperation of local communities is essential in addition to the use of latest pollution control technology. In fact, such cooperation is an integral part of the project and requires extensive preparation. And good communication with local residents and organizations plays a vital role in achieving the goal by exchanging opinions and keeping each other informed.

(5) Other

The proposed project must offer more attractive conditions than those of the Estonian and Latvian projects.. To achieve the goal, however, it is recommended to emphasize price advantages compared to the EU and wood resource reserves, which is more effective than advertising price differentiation, the government' s supply guarantee and other advantages compared to Estonia and Latvia.

11.11 Need for Policies and Programs Focusing on Foreign Investment

(1) Major issues related to attraction of foreign investors to the proposed project

From the results of the field surveys conducted so far, including interview surveys of a number of organizations, the study team obtain important findings that are summarized as follows.

- 1) In light of the recovery of the world pulp market and increased global procurement and production, the project will likely attract attention of pulp and paper companies. In fact, the questionnaire survey of a limited number of companies indicates that several companies are considering construction of a new mill and wish to obtain a final report on this project (Four companies requested the report and three of them feel the need for new mill construction.).
- 2) Foreign firms operating in Lithuania seem to manage relatively well by weathering the Russian financial crisis. However, they point out a number of problems related to government service, which degrade the business environment they are operating, including: (1) slow and insufficient service; (2) lack of timely and useful information and advice; and (3) unnecessary inspection and check. These problems are also raised by the World Bank and other international organizations. As mentioned earlier, the FIAS, the World Bank and the IFC compiled the report entitled “ The Lithuania Study of Administrative Barriers to Investment” in 1999, and the Lithuanian government established the Supervisory Commission for Preparation of Strategic Plan on Improvement of Business Environment that consisted of 12 groups. The commission has started discussion on board subjects, but it may not be able to produce meaningful results as it is represented by various industries and organizations that have conflict of interest. On the other hand, few complaints are heard about government service in Estonia. In Latvia, similar surveys were conducted in 1998 and follow-up surveys in 2000. As a result, improvements in many areas have been confirmed.
- 3) Today, most countries are constantly evaluated by various organizations for their investment climate and business environment. In many ratings, Lithuania is placed behind Estonia and Latvia. Nevertheless, the results of the interview

and other surveys do not indicate significant differences among the three countries, except for quality of government service. On the other hand, Lithuania is widely recognized for its slow pace of change, which is reflected in ongoing reforms of public service. As many countries are fiercely competing for foreign investment, especially direct investment involving construction of new factories, administrative and other reforms should be promoted vigorously as the means to create the country's edges in the global competition.

(2) Need for commitment by the political leader and the government

To ensure successful implementation of the proposed project, intensive and continued commitments by the political leader (prime minister) and the government are the first requirement.

A large project such as this involves a large number of stakeholders who negotiate to reflect their own interest in proceeding with the project;

Stakeholders in this project include the Ministry of Economy, the Ministry of Environment, the Ministry of Social Welfare and Labor, the Ministry of Agriculture, the LDA, local governments and private enterprises who show interest. The negotiation process will be inevitably complex and thus will require strong commitment and support of the political leader and the executive office. Without it, the project will soon reach a stalemate in the sea of the intertwined conflicts of interest that seem to be rampant in the present government organization.

Also, continuous commitment by the leadership is essential in keeping the vigor of the stakeholders and potential investors because it takes considerable time for foreign investors to make investment decision as they carry out feasibility study. The commitment, announced by the government, creates a sense of security for potential investors to make commitment on their side.

The strong commitment should be the prerequisite to implementation of the subsequent program.

1) Wood supply guarantee in competitive condition

Foreign firms are expected to consider availability of raw materials as the primary factor for investment decision, which is far more important than other factors. This should be assured by the government's supply guarantee.

In fact, the Latvian and Estonian governments are considering the supply guarantee to cover 30% - 50% of log requirements for their pulp mill projects.

The Lithuanian government is expected to offer the supply guarantee that can compete with those offered for the competing projects and the national forest agency should offer a long-term supply contract (10 – 20 years) for a foreign pulp company, under an annual or semi-annual price negotiation system based on the market price.

2) Competitive advantages for mill construction and operation

The results of the interview surveys of foreign operators and the questionnaire survey of potential investors indicate that good transportation networks and low operating costs are important factors for selection of a pulp mill site. The government is required to be flexible and innovative in meeting these requirements. In addition, tax incentives are an important factor for investment decision. While respondents to the questionnaire survey did not cite tax incentives as an important factor, the interview surveys reveal that some foreign firms operating in the country highly value the old taxation system (before 1997) with tax incentives. As tax incentives have the most tangible effect on the return on investment, the Lithuanian government should offer tax incentives equivalent to or better than those applied to the competing pulp projects in Latvia and Estonia. As pointed out earlier, the Estonian government reduced the corporate income tax rate to zero in 2000, in an attempt to provide a simple, comprehensive package of investment incentives for foreign firms.

3) Establishment of a task force team under the strong leadership

Various reports and analyses suggest difficulty in ensuring efficient and collaborative management of a public program or project that involves multiple government organizations in Lithuania, which still retain the remnants of the bureaucratic system

in the former Soviet era. The reforms of public service by the Lithuanian government seem to be far from producing the definite results.

Fortunately, however, the government has gained some experiences in bringing foreign investment to the country. In fact, it can boast the cases of Siemens and Peninox as great success stories. These projects were once stalemated in the course of negotiation. Prime Minister Paskas appointed Mr.G.Rainys, vice minister of the Ministry of Economy, to the project leaders. He was given of full power and authority to use all the government functions for implementation of the projects. He successfully demonstrated a strong leadership in moving the projects out of the deadlock. While this approach is still effective, some modification is required to reflect the changes in the bureaucratic system since then. It is therefore recommended to appoint a task force team that is led by an executive officer with strong leadership and several experts assigned from related ministries and agencies.

The membership should be less than 10 in order to ensure quick decision and action, while all members should be fluent in English.

An example of the team organization is shown below:

Table 11.11.1 Task force team by stages

Function	A person in charge	Promotion stage	F/S stage by companies	Construction stage	Operation stage
Project leader	Vice minister of the Ministry of Economy				
Coodinator	A staff of the Ministry of Economy				
Marketing/ investor relations	A staff of LDA				
Forestry resource/ wood supply	A staff of Forest agency				
Environment	A staff of the Ministry of Environment				
Local community/ regional relations	A staff of the Ministry of Agriculture and local governments				

Reference) :very important, : important, : participation necessary

Sources) JICA study team

4) Establishment of the “ one-stop shop” system and expansion of the LDA

According to the results of the interview surveys of foreign firms operating in the Baltic States, those operating in Lithuania are dissatisfied with inefficient and slow government response and action, particularly the lack of information input related to the ongoing institutional reforms and their impacts, and the lack of timely or appropriate advice.

In contrast, these complaints were not heard from foreign firms operating in Latvia and Estonia. While the interview surveys do not necessarily reveal all impediments or barriers to foreign investment, they at least confirm the similarity to the reports of the World Bank, the EBRD and other international organizations.

As foreign firms establish local subsidiaries, acquire land, build factories and other facilities and operate them, they have to contact and negotiate with a number of government offices and other organizations. Clearly, the present bureaucratic system is perceived as a major barrier to foreign investment, and an effective solution is to create or appoint an organization which serves as a single contact point for foreign firms to provide integrated service. Foreign firms can ask questions to and obtain answers from the organization, ranging from market research to the start of operation.

Typically, such “ one stop shop” system provides: (1) information on the legal framework, systems, policies and programs related to foreign investment and its promotion; (2) information on investment opportunities; (3) regional information including special zones or areas designated for investment promotion; (4) support for administrative and other procedures related to investment; and (5) support for specific issues related to investment (e.g., finance, labor, taxation). As these functions are primarily possessed by the LDA, the “ one stop shop” service organization will likely be based on the LDA with some additional functions as required.

In Latvia, the corporate registration office will merge with the tax registration office in 2001 and the new organization will move to the building that accommodates the Latvia Development Agency. The new office will also

contain offices of lawyers and business consultants, and information desks of international organizations. It will still fall short of “one stop shop” service but will be fairly convenient for foreign firms.

5) Transparency of the project and its process to the public

This project will require a large amount of money, with the initial investment amounting to approximately USD900 million and the annual operating cost of USD150 million. It will employ around 600 people. As the project is expected to create considerable economic interest for the entire country and the area where the project takes place, it is important to implement it in a fair manner by securing transparency of the entire process from inception to planning, implementation and management. In particular, transparency must be maintained for various negotiations that often become a spawning ground for unfair practice, corruption and anti-competitive act.

6) Treatment of companies who have expressed interest

As promotional materials are distributed, there will be companies which will express interest in the project. While appropriate information should be provided to such inquiries, it is not desirable to evaluate these companies by rating them in order of preference at an early stage; it does not serve the best interest of the project of such large size. They should be evaluated in overall consideration of numerous factors, including the intent and policy related to the project, as well as reputation and credibility.

If more than two companies express interest, the request for proposal may be issued to selected company groups to compete for the best proposal. On the other hand, additional promotion may be required if only a few or no candidates appear. In this case, efforts should be expanded to focused promotion for selected countries and companies in cooperation of Lithuanian embassies.

- (3) General policies and programs required for effective recruitment of foreign firms

- 1) Updating of promotional materials and image-building strategy

Promotional materials currently available for purpose of attracting foreign investment are primarily focused on the overall business environment and information required for foreign firms to start up business in Lithuania..

For foreign firms to use them as the basis of investment decision, however, they should contain cost information on labor, plant operation and maintenance in the Baltic States, Eastern Europe and the EU. As many foreign firms, particularly multinationals, look for business opportunity broadly, cost data in the Baltic States are not sufficient, nor impressive. By providing data in broader perspective, Lithuania will be able to make its comparative advantages stand out more clearly.

Today, many multinationals are developing or executing a new strategy to grab the opportunity presented by the EU expansion. Most foreign firms interviewed by the study team, especially those in Latvia and Estonia, anticipate that the Baltic States will be evaluated for their cost competitiveness and high quality labor force after their participation in the EU.

Also, the questionnaire survey of potential investors received favorable responses, despite the fact that it was conducted when the project remained in an early planning stage. Therefore, it is important to make repeated contact with key personnel of multinationals in charge of European operation by using the revised promotional materials.

It is also desirable to prepare and distribute pamphlets and other source materials covering other prospective industries, such as electrical and electronics, food processing, textile and garment, and IT.

- 2) Establishment of a special council on elimination of barriers to foreign investment

The Japanese government has been establishing special councils on a variety of subjects, which consist of executive officers of major corporations, scholars and other experts who are appointed by the prime minister. Generally, the special

council confers on the subject matter commissioned by the prime minister and issues recommendations to the prime minister or the government (Note: The council itself does not have legal authority of its own, but its opinion is considered to represent the public interest.). A primary example of the special council is the administrative reform council, which was organized in the 1980s to make policy recommendations on privatization of state enterprises and administrative reforms. In the 1990s, a special council was formed to discuss industrial renaissance policy for the 21st century. Many of these councils have issued insightful recommendations based on the private sector's strategy and approach, which have major impacts on government policies and programs.

3) Compilation of the white paper on industrial strategy in the 21st century

Today, major corporations operating throughout the world are constantly initiating many changes in business operation in order to adapt themselves to the changing world trade order, increased economic interdependence on a regional basis, and drastic changes in business style as well as lifestyle caused by the IT revolution. The dynamically changing business environment as a result of such wave of changes is urging many countries to redesign their industrial policies and programs on the basis of a profound outlook for the future business world.

The white paper is an effective tool to help the Lithuanian government to reassess its industrial policies and programs and to set priority in such way to allow the country to address the future challenges and capitalize on opportunities, while prescribing the ways to eliminate the barriers to business development. The white paper will consist of competitive analysis of key industries, impact analysis of the EU participation, future development scenarios, desirable policies and programs, and industry-specific promotion strategies.

**Chapter 12 CURRENT STATE OF THE PAPERMAKING
INDUSTRY IN LITHUANIA AND MAJOR
ISSUES**

Chapter 12 CURRENT STATE OF THE PAPERMAKING INDUSTRY IN LITHUANIA AND MAJOR ISSUES

12.1 Current State of Paper Manufacturers in Lithuania and Major Issues

12.1.1 Supply and Demand Trends

Between 1990 and 1998, domestic demand for paper, paperboard and allied products was expected to show a slight decline of 0.27% on an annualized basis. However, demand dropped from 152150 tons in 1990 to 97070 tons in 1998. The actual demand growth rate was negative 5.46% on average up to the end of 1998. Breakdown of consumption by product category is summarized in Table 12.1.1.

Table 12.1.1 Paper and Paperboard Demand in Lithuania
(Actual and Forecast)

(Unit: ton/year)

Product category	Actual	Demand forecast				Actual (*2) demand	
	1990	1998		2010		1998	
	Consump.	Consump.	AGR %	Consump.	AGR %	Consump	AGR %
Newsprint	10000	15813	5.90	28000	5.28	17800	7.47
Pr & wr paper	34700	40185	1.85	73000	3.79	18250	7.72
Tissue	5250	8176	5.69	13000	4.64	11400	10.18
Liner/fluting	33200	28609	1.84	49000	1.97	15600	9.01
Cartonboards	23100	25268	1.13	44000	3.27	13600	6.41
Other grades	45900	30832	4.85	45000	0.10	20420	9.63
Total	152150	148884	0.27	252000	2.55	97070	5.46
Population × 10 ³	3752	3880	0.42	4390	0.79	3700	0.17

Sources *1: Forest Sector Development Programme (FSDP) dated Nov.25,1993

*2: JICA study report, Pulp Statistics (Tadao Shiina)

Note: AGR : Annual Growth Rate

During the same period, domestic production of paper, paperboard and allied products also plummeted from 215800 tons in 1990 and 213400 tons in 1991, to 30700 tons in 1996 and 37300 tons in 1998. This was a faster pace of decline exceeding that of demand.

At present, Lithuania exports pulpwood log (700000 – 800000 m³/year) but does not product pulp at all. Paper and paperboard (writing paper, household paper, packaging paper, and fluting medium) are produced by primarily using

waste paper, and a majority of products (50 – 60%) are exported. Domestic demand is largely satisfied by imports. As shown in Table 12.1.2, imports accounted for 83% of domestic consumption in 1998.

Table 12.1.2 Production and Consumption of Paper and Paperboard in Lithuania

Item	1990(*1)	1991(*1)	1996(*2)	1997(*2)	1998(*2)
Production (ton)	215800	213400	30700	24700	37300
Imports (ton)			75600	80200	80900
Exports (ton)			34080	27040	21130
Nominal consumption (ton)	152150		72220	77860	97070

Sources *1: Forest Sector Development Programme(FSDP)dated Nov.25,1993

*2 JICA study report, Pulp Statistics (Tadao Shiina)

The similar trend is also seen in other industries, which export the bulk of their products. Since 1997, the value of exports has been accounting for more than 50% of total industrial output except for electricity, gas and water supply.

Note that production data in 1997 and 1998 shown in Table 12.1.3 do not agree with those in Table 12.1.2, probably because of difference in definition of the year..

Table 12.1.3 Recent Trends in Production of Paper and Paperboard and Export Ratio (1*)

Item	1996	1997 half	1997	1998 half	1998	1999 half
Paper production (ton)	16836	8173	14857	6815	13057	4941
Paperboard production (ton)	13910	7668	14520	10345	19253	11209
Total production (ton)	30746	15841	29377	17160	32310	16150
Export ratio (%)	50.0		58.5		58.8	

Sources *1: The Survey of the Lithuanian Economy/1999 November/ Lithuanian Department of Statistics

Recently, the manufacturing sector in Lithuania, excepting utilities (e.g., electricity, gas and water), has been losing share of the national economy. In particular, the pulp and paper industry's production levels have been experiencing significant declines including productivity, as shown in Table 12.1.4.

Table 12.1.4 Comparison of Pulp/Paper and Other Industries
in Lithuania (*1)

Item	Unit	1995	1996	1997	1998
Industrial output (*2)	Million LTL	12900	16400	20000	20000
Share (*3)	%	1.9	1.4	1.4	1.3
Labor productivity (*4)	LTL/person/hour		42.46	50.37	54.49
Pulp and paper industry' s productivity	LTL/person/hour		29.22	42.15	40.61

Sources *1: The Survey of the Lithuanian Economy/1999 November/ Lithuanian Department of Statistics

*2: The industrial output represents the value of industrial production except for electricity, gas and water, indicated at nominal price.

*3: The share denotes the ratio of the value of production by the pulp and paper industry to that of total industrial production except for electricity, gas and water.

*4: The labor productivity represents productivity per worker of all industries except for electricity, gas and water (at 1996 price)

The pulp and paper industry in Lithuania has long been incorporated into the central planning economy in the Soviet Union, under which manufacturing enterprises were mandated to assume the assigned function by receiving supply of principal materials (pulp, submaterials and fuels) from the Soviet Union, manufacturing paper products using old production equipment and abundant labor force without consideration to efficiency and productivity, and delivering them to the Soviet Union. With the collapse of the Soviet Union and the Lithuania' s regaining indepdence in 1991, however, the industry lost sources of raw materials and export markets for their products that continued over almost five decades, rapidly undermining its foundation and threatening its very existence. The magnitude of impact received by the Lithuanian economy from the economic turmoil of the Soviet Union is summarized in Table 12.1.5, which shows a rapid decline of GDP to one thirteenth the peak level between 1991 and 1992.

Table 12.1.5 GDP Trends in Lithuania

	1988	1989	1990	1991	1992	1993	1994	1995	1996
Nominal GDP	18584	19561	19365	24161	1910	2557	4269	5957	5269
Per capita GDP	5054	5270	5182	6441	509	682	1140	1595	1510
Constant (1990 price)	20133	20800	19365	16828	17764	12371	12493	12865	13411
Growth rate (%)	11.3	3.3	6.9	13.1	5.6	30.4	1.0	3.0	4.2

Sources : National accounts and industrial production

As a result, starting in 1992, the pulp and paper industry was forced to manage their business and make profits under a market economy and reorganize corporate structure, which was unthinkable under the centrally planned economy. Nevertheless, it is still in the middle of recovery from the rapid economic shrinkage and has been hit hard by the Russian economic crisis in late 1998. The industry still has a long way to stand on its feet and grow steadily and is even receiving an adverse wind to delay its recovery, including the aging of production facilities and equipment, and technological obsolescence.

12.1.2 Current state of the papermaking industry in Lithuania

Among five paper and paperboard manufacturing companies operating in the country, the study team visited four companies, namely AB Klaipėdos Kartonas, AB “Haujieji” Verkių, Grigiskės Joint Stock Co., and Kauno Popierinių Fabrikas (Pabradė Cardboard was not visited). While they are unique in various aspects, there are several points common to all of them.

(1) Production facilities

1) General

(i) Production equipment

They do not have pulp making equipment or that in working condition.

The waste paper treatment process consists of a dissolving pulper and a dust remover.

All the machines are old and obsolete, except for the Inverform board machine (basic weight of 80 – 400kg/m², paper width 4200mm, paper making rate of 457m/min) that was installed at AB Klaipėdos Kartonas in 1973.

Only Grigiskės Joint Stock Co. installs both a boiler and a turbine generator, but it does not operate the generator and purchases electricity from outside.

Effluent is only treated through a settling tank and a clarifier to remove suspended matters before being sent to a treatment plant operated by the local government, partly because none of the mills manufacture pulp.

Maintenance personnel is assigned on a full-time basis, although all the mills have not been operated on a continuous basis during the recent few years.

(ii) Production trends

Tables 12.1.2 and 12.1.3 show r paper and paperboard production trends in the recent few years, and Table 12.1.6 production capacities and actual production volumes of major manufacturers. Note that data in 1998 and 1999 (actual) were obtained during the interview surveys and are slightly larger than those in other sources.

Table 12.1.6 Production Capacities and Actual Production Volumes of Paper and Paperboard Manufacturing Companies

(Unit : t/y)

Name of Company Grade		Grigishky		Kaunas Paper		Klaipeda Katonas		Nauieji Verkiai		TOTAL	
		FSDP*1 Report 1993	JICA Study 2000	FSDP Report 1993	JICA Study 2000	FSDP Report 1993	JICA Study 2000	FSDP Report 1993	JICA Study 2000	FSDP Report 1993	JICA Study 2000
		1991	1999	1991	1999	1991	1999	1991	1999	1991	1999
Paper and paperboard	Capacity										
	Print,writ,copy			55000						55000	0
	Other paper	25000		15000		5000	5000	20000		65000	5000
	Paperboard	20000				122000	85000			142000	85000
	TOTAL	45000	8000	70000	12000	127000	90000	20000	12000	262000	90000
	Production-1998										
	Print,writ,copy			43300	5000			1400		44700	5000
	Other paper		8000				800		1622	0	10422
	Paperboard						200		3341	0	3541
	TOTAL		8000	43300	5000	0	1000	1400	4963	44700	18963
	Production-1999										
	Print,writ,copy				1800					0	1800
	Other paper		8000				2200		3000	0	13200
	Paperboard						21000		4800	0	25800
	TOTAL		8000	0	1800	0	23200		7800	0	40800
Pulp	Capacity	1991	1999	1991	1999	1991	1999	1991	1999	1991	1999
	GP	13200	0			41200				54400	0
	Waste paper pulp	28000	28000	4000	4000		26000	11600	11600	43600	69600
	Sulphite		0			53,500				53500	0
	TOTAL	41200	28000	4000	4000	94700	26000	11600	11600	151500	69600
	Production-1999										
	GP		0		0		0		0	0	0
	Waste paper pulp		10000		2200		26000		10000	0	48200
	Sulphite		0		0		0		0	0	0
	TOTAL	0	10000	0	2200	0	26000	0	10000	0	48200

Sources *1: Forest Sector Development Programme (FSDP) dated Nov.25,1993

(iii) Pollution control measures

Effluent treatment: Effluents from the paper mills are treated through mechanical primary treatment systems (settlement and separation of suspended matters) and are sent to municipal treatment plans.

As production is only one half or third capacity, a serious environmental problem is not expected under the present treatment system

Air pollution: None of the mills uses a recovery boiler, a lime kiln or an auxiliary boiler burning fossil fuel.

Again, low levels of production far below capacity reduce a risk of air pollution considerably.

Other factors: Three companies (except for Kaunas) have paper mills within large sites, which are not likely to cause any nuisance (noise, etc.) to the surrounding environment.

2) General profiles of paper and paperboard manufacturers

(i) AB Klaipėdos Kartonas

a. Year of establishment: 1898

b. Paper mill's location: Adjacent to Klaipėda Port (a major ice-free port in Lithuania)

c. Employment: 500 (including managers, 110 engineers and technicians, and 80 staff related to effluent treatment equipment)

d. Site area: 32 ha

e. Paper machines used

Paper machines : PM & BM No.	PM1	BM1	BM2	BM3
Main Products	wrapping paper	boxboard	boxboard	coat/non-coat
Capacity(t/d)				
Type of wire part	fourdrinier	cylinder	cylinder	inverform
Basis weight(g/m ²)	60 ~ 80			81 ~ 400
Trim width(mm)	1500	2000	2500	4200
Max. speed(m/min)	90	55	55	457
Observations	stopped	stopped	stopped	size press

Major equipment: Beloit Inverform board machine (1 set), size press and on-machine coater

Basis weight 80 – 400g/m², paper width 4,200mm, paper making rate 457mm, start of operation in 1973

f. Products and production

test liner + corrugate medium ~ 20986 ton (90%)

box-board + wrapping paper ~ 2187 ton (10%)

Total ~ 23173 ton (approx. 10 Mill USD)

- g. Markets: Domestic 50% and export 50%
- h. Raw materials: Waste paper, domestic 50% and import 50% (Baltic States, Russia (Kalinengrad) and Poland)
300 tons/year from NUKP Russia (Kalinengrad) and 300 tons/year from NBKP Russia (Kalinengrad)
- i. Steam: Boiler $39\text{kg/cm}^2\text{g} \times 20\text{t/h} \times 2\text{sets}$ 10 ~ 14t/h
Consumption rate: $3.2\text{ kg/cm}^2\text{g} \times 10 \sim 14\text{t/h}$
- j. Electricity: 3.5MW purchased at 140 Litas/MWh) (USD35/MWh)
- k. SP equipment: Formally shut down in 1993 (it was suspended after the collapse of the Soviet Union).
- l. Effluent treatment plant: Capacity – 20000 m³/day, current load – 10000 m³/day; discharge will be sent to a municipal treatment plant when completed.
- m. Operating status: During our visit, the machine was under repair and was not operated. Judging from the machine' s capacity, it seems to be mostly suspended.
- n. Working conditions: Two-shift (four teams), 12 hours/shift, 40 hours/week/person
- o. Future investment plan: The company plans to boost waste paper processing capacity (100 tons/day) to 50 tons/day at a cost of USD4 million.
- p. Major concern: Market development

(ii) AB Naujieji Verkiai Vilnius

- a. Year of establishment: 1834
- b. Paper mill' s location: In the suburb of Vilinius City, 20 – 25 minutes by car
- c. Employment: 190 (including 40 mechanical maintenance staff and 12 electrical equipment maintenance staff)
- d. Site area: __ ha
- e. Tissue paper making machine
Type: fourdnier + yankee
Major features: Paper width 2400mm, basis weight 30g/m³,
papermaking rate 200m/min
Capacity: 15 tons/day
Operating status: 1 – 2 weeks/month

Production volume: 200 – 250 tons/month

f. Board machine

Type: fourdnier + multi cylinder

Major features: Paper width 2400mm, basis weight 40 - 160g/m³,
papermaking rate 150m/min

Capacity: 24 tons/day

Operating status: 1 – 2 weeks/month

Production volume: 350 – 400 tons/month

g. Total production (tons/year)

Tissue paper: 3000

Corrugated medium/packaging paper: 4800

total: 7800

h. Cost structure

Raw material: 30%

Energy: 30%

Labor: 25%

Others: 15%

i. Consumption of waste paper: 700 tons/month

j. Waste paper prices (Litas/ton)

Corrugating medium: 270

Newspaper and magazine: 170

Miscellaneous: 170

White: 300

k. Sales: 1 million Litas/month

l. Average wage: 800 Litas/month

m. Utilities

Natural gas: Consumption 257m³/month, unit price LTL0.416/m³

Electricity: Consumption 514MWh/month, unit price LTL138/MWh

Water: Consumption 16,300m³/month, unit price LTL0.378/MWh

(iii) Grigiskes Joint Stock Co.

a. Year of establishment: 1923

b. Paper mill' s location: 20 – 25 minutes by car from Vilinius City, along
the national highway

c. Employment: 1000 (280 related to paper making and the remaining
related to fiberboard)

d. Site area: 57 ha

e. Paper machine

PM	1	2	3	4	5
Main Products	tissue	tissue		tissue	tissue
Capacity(t/d)					
Type of machine	yankee	yankee	fourdrinier	yankee	yankee
Basis weight(g/m ²)	25 ~ 35	25 ~ 35		25 ~ 35	
Trim width(mm)	2100	2100	2500	2100	2100
Max. speed(m/min)	300	300	110	300	65
Production(t/d)	25	25	10	25	6
Observation			stopped		stopped

f. Total production

Household products (tissue paper, paper towel, etc.): 8,000 tons/year

Fiberboard: 14 million m²/year (3kg/m²), domestic 30% and export 70%

g. Raw materials

Paper	Consumption (tons/year)	Price (USD/ton)
White waste paper	1000	100
Mixed waste paper	9000	50
BSP (imported)	300~400	

Waste paper prices are governed by quality, which is evaluated and determined by Grigiskes. Moisture content is measured and reflected in the price decision.

Fiberboard: L and N woods are collected from all over the country.

140000 m³/year (100 fiberboard m²/1 real wood m³)

h. Waste paper yield: 70% at minimum

i. Inventory level: 2-3 days at warehouse and 500 – 700 tons in an outside stockyard

j. Power facilities

Boilers: 6 sets, 160 t/h (some portion of steam is supplied for municipal usage), natural gas

Turbine generators: 3000 kW (2 sets × 1500 kW/set)

Electricity: Purchased from the power company

k. Effluent treatment plant

Discharge rate: 1000 m³/day

Conical settlers (8 sets)

Clarifiers (4 sets) (2 for paper machines and 2 for fiberboard machines)

Effluent quality: Varying with operating conditions of paper and fiberboard machines

Final disposal: Sent by pump to the municipal treatment plant in Vilnius

Treatment cost: Not known

l. Sales: US\$17 million/year

(iv) Kauno Poperious Fabrikas

a. Year of establishment: 1934

b. Paper mill's location: An industrial district adjacent to a lake within Kaunas City

c. Employment: 400

d. Site area: 11 ha

e. Paper machines

PM	1	2	3	4	5
Main Products	wrapping	book paper			
Capacity(t/d)					
Type of wire part	fourdrinier	fourdrinier	fourdrinier	fourdrinier	fourdrinier
Basis weight(g/m ²)	60 ~ 80g/m ²				
Trim width(mm)	2520	2520	2520	2520	2520
Max. speed(m/min)	155	200	320	320	100
Observations			stopped	scrapped	scrapped

f. Production status

In 1991, the mill produced 72000 tons of printing and writing paper and packaging paper using virgin pulp. After the end of the Soviet Union, pulp prices rose and the mill can only afford to use waste paper only. As a result, product quality has been deteriorated and the company has lost competitiveness, resulting in a rapid decline in production (4000 tons in 1996 and 1997, 5000 tons in 1998, and 1800 tons in 1999).

When the study team visited the mill, the paper machines were not operated. Only children's workbooks were produced using book paper, which was bartered with final products (no price was revealed).

g. Utilities

Steam and electricity are supplied from outside sources.

Water consumption: 40 – 50 m³

h. Effluent treatment

Effluent is primarily treated through a mechanical system and is sent to the municipal treatment plant, which will add a latest mechanical treatment system in 2000 and a biological treatment system in 2003.

i. Others

In addition to the paper machines, the mill owns a Japanese-made coater, a laminator and five slitters and seldom uses any of them. Interestingly, there was a non-carbon paper coater (one set), which was used to produce non-carbon paper at the end of last year.

(2) Availability of raw materials

1) Waste paper

Waste paper is a primary raw material for production of paperboard and decorative paper, which are principal products of the papermaking industry in Lithuania. Therefore, it forms an integral part of stable operation of papermaking activities. In fact, waste paper forms a relatively large market that serves as a mainstream channel for reusable resources in the country, where prices remain at relatively low levels. While the low price offers a cost advantage for paper companies, it has hit private operators hard, who successfully developed the market and the resource recycling channel over years. The collapse of the supplier base has distorted the recycling channel, where waste paper is discarded as general wastes from which recovery is made. This has deteriorated quality of waste paper traded in the country significantly. In fact, the situation is more or less the same in many other countries, and the countries that generate waste paper in excess of recycling capacity need to export it in order to reduce the stockpile, leading to the decline in international market price and deterioration of quality.

Therefore, the decline in waste paper prices and the increase in recycled quantity, seemingly favorable for paper companies – paperboard manufacturers in particular – also work against them in the long run, i.e., deterioration of product quality, the need for capital investment for sorting of waste paper and removal of undesirable wastes. In particular, high-grade waste paper is essential in production of decorative paper and is currently imported, but its quality is also deteriorating.

Based on the available data, the domestic waste paper market, imports and exports are summarized as follows.

	(Unit: 1000t)			
	<u>Locally collected</u>	<u>Imports</u>	<u>Exports</u>	<u>Locally traded</u>
1997	28000	6200	3400	30800
1998	29000	8500	2700	34800
1999	35700	12000	4400	43300

In 199, local collection increased rapidly to boost the locally traded quantity by 20% from the previous year, creating high expectation for increased paper production.

In fact, the available production statistics indicate that production in 1999 (up to the third quarter) reached 37000 tons, close to that in the entire year of 1998, with the operating rate up 10%.

As for the pulp supply and demand situation, domestic production increased 11000 tons in 1999, all of which made from waste paper pulp, whereas pulp imports (bleached SP) declined 8300 tons.

**Table 12.1.7 Domestic Waste Paper Market, Imports and Exports
(Thousand Tons)**

		Collection and production	Imports	Exports	Domestic trade
1997	Waste paper	28.0	6.2	3.4	30.8
	Waste paper pulp	24.8	0.6	0	25.4
	Total	52.8	6.8	3.4	56.2
1998	Waste paper	29.0	8.5	2.7	34.8
	Waste paper pulp	24.3	0.8	0	25.1
	Total	53.3	9.3	2.7	59.9

Note: Waste paper pulp is considered to be locally produced on the basis of the statistical data. Assuming the 70% yield, waste paper consumed for pulp production in 1997 and 1998 was estimated at 35400 tons and 34700 tons, respectively.

							Wastepaper Recovery rate*	
	Recovery		Imports		Exports		1998	1999
WASTEPAPER	1998	1999	1998	1999	1998	1999	1998	1999
43. Wastepaper collected	29.0	35.7	8.5	12.0	2.7	4.4	17.0	37.0

*Paper and board collected and recycled as a percentage of consumption.

	(in 1000 metric tons)						Mill operating rate %	
	Production		Imports		Exports			
PAPER AND BOARD	1998	1999	1998	1999	1998	1999	1998	1999
16. Newsprint	-	-	20.0	19.0	2.2	0.8		
17. Printings/writings of which	0.7	1.0	22.2	22.5	4.7	2.8		
18. Woodfree uncoated	0.7	1.0	9.6	8.5	3.8	2.4		
19. Woodfree coated	-	-	5.6	6.2	0.7	0.3		
20. Mechanical uncoated	-	-	1.2	1.9	0.1	0.00		
21. Mechanical coated	-	-	5.8	5.9	0.1	0.1		
22. Corrugating materials of which	11.4	23.8	12.9	9.7	8.7	5.1		
23. Virgin fibre liner	-	-	12.1	8.7	5.5	3.7		
24. Waste-based liner	7.0	16.0	0.4	0.3	3.2	1.4		
25. Virgin fibre fluting	-	-	0.4	0.71		-		
26. Waste-based fluting	4.4	7.8	-	-	-	-		
27. Other wrapping papers	2.4	0.9	0.5	0.3	0.1	0.00		
(sack paper, glassine, machine glazed wrapping paper, bag papers, etc.)								
28. Tissue & towelling	11.5	8.0	0.3	0.23	0.4	0.8		
29. Other paper		0.1	21.2	16.0	3.6	1.0		
30. Board	11.3	3.0	3.8	3.8	1.5	1.3	7.6	19.1
(cartonboard, other boards)								
31. Total paper & board	37.3	36.8	80.9	71.5	21.3	12.1	16.2	26.4

*Data for three quarters 1999.

	(in 1000 metric tons)						Mill operating rate %	
	Production		Imports		Exports			
PULP	1998	1999	1998	1999	1998	1999	1998	1999
32. Bleached sulphate (Kraft)	-	-	0.5	0.4	-	-	-	-
33. Unbleached sulphate (Kraft)	-	-	0.1	0.2	-	-	-	-
34. Bleached sulphite	-	-	13.0	4.7	10.6	3.8	-	-
35. Unbleached sulphite	-	-	1.4	0.0	1.2	-	-	-
36. Semichemical	-	-	-	0.0	-	-	-	-
37. Mechanical	1.3	0.1	0.0	0.0	0.6	0.1	2.4	0.2
38. Other pulpwood	-	-	0.1	0.6	0.6	0.0	-	-
39. Wastepaper pulp	24.3	36.1	0.8	0.1	-	0.1	48.9	73.6
40. Other nonwood pulp	-		-	-	-	-	-	-
41. Total pulp	25.6	36.2	15.9	5.9	13.0	4.0	-	-
42. Market pulp	0.7	0.1	15.9	5.9	13.0	4.0	-	-

Although these statistical data contain some errors and discrepancies among different data sources, they allow the reading of general trends.

It should be noted, however, that detailed trade patterns are difficult to read from the macro data because paper manufacturers are trading waste paper and

products in diverse ways, e.g., some obtain cutting wastage in exchange for supply of final products and export products made from wastes generated within their own sawmill facilities. As waste paper constitutes a primarily raw material for the industry, efforts should be made to collect accurate data and information reflecting the current state and analyze them if the market is to grow steadily.

Industrialized countries exchange waste paper market data, including quantity, quality and price, in an attempt to maintain market stability, because volatility of the market is considered to pose a serious problem for paper mills that consume waste paper in large quantities. As waste paper is not a commodity product which production and distribution is freely controlled, it takes considerable efforts to maintain the supply and demand balance, and stability of price and quality.

2) Imported materials,

According to the available statistics, pulp imports totaled 16 tons in 1998 and 6 tons in 1999, and 80% of which were exported. Thus, pulp is not considered as a locally consumed material. On the other hand, it will play an important role in creating an opportunity for product development and market exploration of the industry. In addition to local pulp production, the papermaking industry is required to capitalize on its geographical advantages, i.e., proximity to Scandinavia that is the world largest production base and better availability of mechanical pulp.

While reuse of high-grade waste paper is not major concern, as seen in Scandinavia. However, the interest grows in North America and Asia and it will soon become the global trend.

In the near future, the increase in waste paper recovery rate, accompanied by deterioration of quality, will encourage many countries to consume high-grade waste paper locally and export the low-grade one. Thus, the immediate agenda for the industry is to ensure stable supply of high-grade waste paper within the country, followed by effective action to address the industry-wide issue. In Japan, reduction of solid wastes was once booming to increase recovery of waste paper, resulting in oversupply. Then, public concern on

steady recycling of waste paper subsided and quality deteriorated. This gave lessons for paper manufacturers. As a result, paper and paperboard companies have realized stable supply of waste paper, in terms of both quality and quantity, as an important management issue.

Today, waste paper is increasingly viewed as a globally traded product in addition to a reusable resource. Its supply and demand as well as price trends become strategic information for the industry and the market.

(3) Major issues facing paper and paperboard manufacturers in Lithuania

1) Too many manufacturers

At present, the industry produces 100 – 120 tons of paper products per day, mainly household and sanitary paper, test liners, corrugating medium, and paperboard for boxes. The fact that the four mills produce such small amounts using 7-8 machines (1 at Kaipėdos, 2 at Naujieji Verkiai, 2-3 at Grigiskės, and 2 at Kauno Popieriaus) simply does not make any economic sense. Their operation is viable only because the labor cost is low, 1000 – 1200LTL/month. Clearly, it is very difficult for all the mills to continue healthy production at a high operating rate, and this level of production can easily be made by a single mill. In consideration of collection of raw materials and shipments of products, it is recommended to consolidate production to two or three mills operated by one or two companies for the time being. This can be accomplished by merger or the establishment of a consortium to carry out coordinated production sharing. These do not require new investment and can be carried out as soon as the management makes decision. There is a large risk for the companies to go out of business if the current situation continues.

2) Unbalanced product mix

The current product line is dominated by products made from waste paper but does not seem to meet the market needs, although it may have matched the past needs. In the rapidly changing market environment, the industry should search new hit products and adapt its production system to new opportunities. The industry should develop a vision for long-term growth, which embraces product development and the securing of a whole range of raw materials, including waste paper, in the context of market responsiveness and development potential.

3) Weak waste paper recycling system

Efforts should be made to improve product yield and quality by improving efficiency and effectiveness of the waste paper recycling system in the following areas:

- a. Improvement of waste paper quality through the reinforcement of the current waste paper collection system as a resource recycling mechanism, and increase in waste paper supply through the upgrading of the system to recover waste paper from general wastes;
- b. Building of a supply and demand control mechanism under participation of waste paper suppliers and customers;
- c. Improvement of the waste paper storage and dissolution processes;
- d. Introduction of a classification and deinking system for waste paper pulp; and
- e. Upgrading of papermaking technology using waste paper pulp.

4) Low capacity utilization rate

Existing production equipment is rarely operated at its full capacity, although nominal capacity is fairly large. Meanwhile, 70000 – 80000 tons of diverse paper products are imported and will likely grow further. It is urgent to find products that are suitable for the existing production equipment in terms of performance and capacity so as to bring idling production lines back to operation.

5) Under the cross-fire from the difficulty in procurement of raw materials and the disappearance of the major market, the industry is forced to cut off production far below capacity. As production declines, production skills and morale are on the steady decline. If the situation continues, the paper and paperboard industry will deteriorate severely.

The following actions should be taken to halt and possibly reverse the declining trend:

- Inception of industry-wide initiatives to maintain and upgrade production skills and morale;

- Organization of project teams to conduct joint research and study on selected issues that are of common interest to paper and paperboard companies;

- Need for the Lithuanian government to provide support and assistance for in the areas of: (a) finance; (b) human resources; and (c) institutions; and

- Promotion of joint efforts among the Baltic States in relevant fields.

12.2 Collection and Recycling of Waste Paper: Current State and Major Issues

(1) General

a. World trends related to waste disposal and management

The rise in living standards accompanies an explosive increase in consumer goods, particularly in industrialized countries, that are available in a variety of forms for daily use. They are turned into wastes, some of which are difficult to dispose in the traditional waste management system. As modern consumer goods combine diverse materials in an increasingly complex design, they have to be carefully disposed, stored and/or managed in the downstream of the mass consumption system, often requiring regulatory control. At the same time, environmental pollution on a global scale raises public concern about the need for conservation of the nature and natural resources, which demands legislation as well as an institutional framework for safe management and disposal of wastes. These moves have gradually spread to developing countries, which have enacted laws and regulations controlling wastes and their disposal. Despite intensified regulation, however, wastes continue to be produced in large quantities and quickly fill up traditional disposal sites unless they are significantly reduced in volume. In response, new waste management methods were introduced, including the recycling of usable resources that is conceived from the desire to preserve scarce resources. Today, recycling is widely adopted and has become everyday practice in many communities. In particular, special legislation has been established for waste paper that accounts for the highest percentage of total waste in terms of volume and weight, in an attempt to reduce its uncontrolled discharge. In fact, the recycling of waste paper has been carried out for a long period of time to use it for paper making, and the current legislation trend focuses on mandatory recycling of paper containers and packaging paper that are increasingly used in industrialized countries.

Furthermore, the recycling system is being developed to promote reuse of components and materials for household appliances and automobiles, which are often discarded without retrieving a variety of important resources.

The current trend indicates that the world community is undergoing a paradigm shift from regulatory control of waste management to the reuse of all valuable resources and minimization of disposed wastes.

b. Relationship between international standards and domestic legislation

In industrialized countries, the legal framework for control of environmental pollution, including air, water and noise, and responsibility and liability of business enterprises, has been established, and the main interest is being shifted to seek the ways to improve the global environment as national and international commitment. The move calls for cooperation of population at large, in addition to the business community, and increasingly asks them to assume fair share of burdens required to achieve the goal.

Under the traditional legal structure mandating proper waste disposal, the scope and nature of regulatory control is more or less the same among countries. The new legal framework focusing on promotion of recycling, however, extends the legal hands to the production process and requires manufacturers and distributors to be responsible for proper waste disposal. This means that the legal effects apply to and even govern economic or social activities, and the legal framework that follows the precursor's model, as done in the past, cannot address various issues that are unique to each country. Naturally, the situation prompts the establishment of a legal system to promote waste recycling according to local conditions of a specific country.

So far, Germany leads the move by enacting the Waste Generation Preparation and Disposal Control Act (1986) and its ramification, the "Recycling Economy Waste Act" (1994, which are considered as a model law by many countries, especially in West Europe. While the German recycling law primarily covers manufactured goods, the country has already established and operates a recycling system for packaging materials, which was made under the old law. Similarly, other industrialized countries including Japan have introduced the similar laws. As for manufactured goods, the German government has issued a decree on recycling of motor vehicles and their parts, and legislation on batteries and information equipment is being discussed in the parliament. Packaging materials are effectively recycled under the DSD which was established under contribution of manufacturers and distributors of related

products. While the DS successfully operates a nationwide collection and recycling system, its monopolistic status and the lack of efficiency in operation are strongly criticized by economic circles. In fact, the DSD is responsible for collection of all types of packaging materials, including paper, plastics, tin plates, aluminum and glass bottles. The recycling system is currently working well and is considered as a model for many other countries to follow, ranging from its organization to operation and management. In addition, the system is well supported by many people who are fully aware of desirable consumer behavior expected for recycling as the sustainable activity. At the same time, however, the DSD faces criticism and is required to make improvement in various aspects.

The EU issued a directive in 1994 to require member nations to enact legislation on collection and recycling of packaging materials by 2001. Already, France, Austria, Portugal, Spain, Belgium, the U.K., Sweden have adopted the laws and regulations, and Luxemburg and the Netherlands are under preparation.

Clearly, the focal point of waste management is moving toward the recycling of reusable resources. In particular, the EU virtually makes the recycling of packaging materials as one of the memberships requirements.

c. Administrative measures and cooperation by the private sector

Waste management is now one of the most important policy issues for industrialized countries. In Germany, the bulk of wastes has been disposed in other countries (including the former East Germany) due to the shortage of disposal sites in a limited land area with a relatively short coastal line. With the reunification of the two Germanys and the Basel Convention, the government was required to dispose wastes within its own territory. One of the few workable solutions was to reduce disposable wastes as far as possible. In other words, the new system is the outcome of the country's efforts to meet the requirements under the changing international politics.

France established a law on waste disposal and designated facilities in 1992. The current policy aims to control and reduce wastes by enlisting cooperation and participation of the manufacturing and distribution industries and

encouraging maximum recovery of wastes for reuse or energy conversion, while educating the general public about effective reduction and disposal of wastes. In 1993, the government issued a decree to mandate prefectural governments to make disposal plans for household and other municipal wastes and to set priority for listing, collection, segregation and disposal of wastes. The ADEME was established as a government organization responsible for activities related to energy saving, resource conservation, reduction of wastes, collection and reuse, and pollution control measures. The ADEME conducts these activities under joint supervision of the Environmental Agency, the Ministry of Industry, and the Ministry of Research.

Final disposal of wastes is either carried out by landfilling or energy conversion. Germany mandates landfilling and France accepts both incineration and landfilling. Germany, however, is forced to accept incineration when the target level of recycling is met. In any case, recycling becomes an essential condition for volume reduction of wastes. And the reusability is governed by quality, which must be maintained through effective segregation. From the viewpoint of economy of segregation including labor costs, it should be carried out in small quantity, i.e., at source. For instance, wastes produced at home can be segregated within a few minutes, while eliminating the labor cost, not to mention the administrative cost. This is why cooperation by general citizens is essential in the recycling process. In fact, households play a determinant role in increasing or decreasing wastes through their ways of purchasing, consuming, using and disposing products. From this standpoint, the government needs to provide the general public with information related to proper waste management and encourage grass-roots involvement in the recycling process. At the same time, the government needs to provide information service and guidance for business enterprises as major waste sources, which would help to gain their understanding on taxation as a financial source to cover disposal costs incurred by government. Proper government action to assume responsibility for waste management, together with public support and cooperation, leads to effective reduction of wastes, the recycling of reusable resources, and the international respect as a precursor in the environmental protection process.

d. Present and future of recycling technologies

Recycling technologies are essentially divided into five segments, namely, reduction, refinement, reuse, recycling and reconversion to energy. They should apply according to the type, quality and quantity of waste to be treated.

First of all, reduction means volume or weight reduction, which can be accomplished by a variety of methods including compaction, crushing and melting. Effective reduction helps control collection and transportation costs, reduce space requirements at stock yards, and ensure steady supply of wastes to the recycling system.

Refinement involves segregation and disassembly. Most wastes are rarely generated in a single form. Some are composed of a large number of raw materials, parts and components. Refinement technology includes magnetic selection of steel cans and retrieval of precious metals from used PCs. There are many products that must be disassembled by hand, such as household appliances. If they are completely disassembled and segregated, it is now technically feasible to recycle most parts and components.

Thirdly, reuse starts from cleaning and repairing of reusable wastes. Then, recycling, in a narrow definition, refers to the processing and conversion of wastes to a raw material or a product. Finally, reconversion to energy is becoming the hot area, including the use of waste heat and power generation using refuse derived fuels (RDFs).

From the technological point of view, the focal point of waste management is moving quickly to recycling, which is increasingly regarded as a new industry, rather than a mere method for waste disposal.

Emerging waste regeneration technologies, as seen today, are capable of converting waste paper (to recycled paper), steel cans (steel bars), glass bottles, food trays, styrene foam (styrene pellets), waste plastics (reducing agent), waste wood (carbonized chips), sludge (bricks), kitchen refuse (compost), and edible oil (diesel oil, animal feed, fertilizer, paint and soap). In addition, many consumer goods, such as disposable cameras, televisions, air-conditioners,

refrigerators, PCs and motor vehicles, can be recycled for productive purposes through the overhauling and disassembly.

(2) Current state of waste disposal in Lithuania and major issues

(a) Current state and major issues

* Legislation

Lithuania has the basic law on waste management, which is based on the law in Denmark. It contains a standard set of provisions, including definitions of terms related to waste disposal and management and regulatory standards. However, it does not set forth the strong intent or commitment of the nation to waste reduction and resource reuse, which is an important element of the contemporary waste management law. There is no ordinance or order to express such intent.

Waste disposal is the primary responsibility of local government that is also responsible for waste reduction. Although the law authorizes the central government to provide financial assistance for local government in implementing related programs, no specific budget has been allocated for the purpose.

* Public administration and organization

The central government does not seem to monitor or supervise waste management activities of municipalities. According to the organizational chart of the government, various ministries and agencies are responsible for waste management and assume their own roles and authorities. In practice, however, most of them assign their work to the Ministry of Economy and assume supervisory position. There is no organization to promote cooperation and support among the related ministries to achieve the common goal or to coordinate their activities and plans.

The field surveys indicate that the central government at large lacks awareness of the need for waste reduction and resource reuse, which are considered as national projects in industrialized countries, and has still to make committed efforts to promote them.

At municipality levels, the study team felt some enthusiasm because they were directly responsible for waste management service. Nevertheless, there is the apparent lack of education and guidance for field organizations that are responsible for day-to-day operation of disposal sites. It sometimes appears that municipal officials leave everything to field organizations or outside contractors specialized in waste handling. They often blame the shortage of fund but appear to lack the willingness to solve problems by using limited resources to a maximum extent.

Waste disposal operation and regeneration technology

Waste disposal seems to be carried out as a routine work without innovative efforts to improve quality of work. The lack of attention to scavengers symbolizes the absence of vigorous efforts to reduce waste and handle wastes in an efficient effective manner.

As for waste regeneration technology, the study team had an opportunity to observe the paper recycling process only. Based on the field observation and the general findings from the manufacturing industry in the country, technological development in this field does not seem to be of high priority.

* Others

As pointed out above, proper waste management requires effective control at source, which is particularly important for promotion of resource recycling. For this purpose, an appropriate method for public education and campaign should be selected in consideration of the country's history, culture, tradition, racial trait and other relevant factors. Public education should aim at conveying to business enterprises and people a clear message that waste management and resource recycling is a national project that determines the future of the country.

b. Collection and reuse of waste paper: current state of major issues

* Generation sources

Waste paper is currently collected through three channels; collection as reusable resources by specialized operators, collection of separated waste components in the waste collection system, and recovery from mixed wastes.

The first channel involves private operators specialized in collection and/or recycling, and quality is assured because of elaborate segregation in the collection process. The second channel does not work well because wastes generated from households are not segregated as specified. In particular, wastes collected in low-income housing areas are rarely segregated to prohibit efficient recovery of reusable resources. The third channel is operated by the waste collection agency (public or private) and can be improved by introducing systematic sorting and segregation at collection points (collection vehicles in many industrialized countries are equipped with special racks for separated waste components). Also, it is feasible to provide a sorting system at disposal sites. Clearly, it is time for the government to list up possible methods and provide assistance or guidance for their implementation.

* Current state of waste paper collection

The waste paper collection business in Lithuania is largely carried out small operators (mostly individuals). As no formal transport system is established, private operators collect and bring waste paper to paper mills. Previously, the waste paper market grew steadily and a number of private operators emerged and formed a cooperative with some negotiating power with paper mills. However, the plethora of operators resulted in excess price competition to drive many out of business and the cooperative lost bargaining power. Waste paper shipments to major paper companies in 1994 are summarized as follows.

Paper mill: Grigikes	(t)
Cooperative	3107
Kaunas• Zaliava	1414
Others (8 companies)	957
Others (details not known)	4034
Pabrades Kartono Fabrikas	
Spindulys	667
Siauliu PK	297
Vilnius PRB	294
Klaipedos PRB	200
Others (11 companies)	864
Klaipedos Kartonas	
4 schools as collection points	7

Clearly, these quantities fall far below the level that makes a viable business.

In 1994, domestic demand for waste paper was estimated at 23751 tons, of which the cooperative handled 35% (5839 tons), while 998 tons were imported and 7212 tons exported.

The cooperative serves as a major distribution channel and consists of 46 members (companies or individuals). It works well and represents good organizational efforts for waste paper suppliers. (See the table below.)

While private operators strive to make their business viable, the government and the paper industry do not seem to provide effective assistance or cooperation. Again, this symbolizes the general lack of commitment to resource recycling that should be of national priority.

Table 12.2.1 Waste Paper Purchase by Major Paper Manufacturers, by Operator

AB "PABRADES KARTONO FABRIKAS" 1994 M. SUPIRKTOS MAKULATUROS KIEKIS TIEKEJAI				
LIETUVOS FIRMOS	KITOS SALYS	KIEKIS (T)	VERTE (LTL)	1995M. POREIKIS (T)
1	2	3	4	5
Svencioniu PK		34.85	2284	
Siauliu PK		297.29	33438	
Sp. " Spindulys"		667.23	60128	
Vilniaus PRB		293.92	35456	
Sp. " Ausra"		50.99	4375	
Sp. " Viltis"		110.51	6836	
Klaipedos PRB		200.36	32640	
Poligraf.pasl.imone		174.6	10970	
AB " Darbas"		189.65	22450	
AB " Vilpakas"		59.3	4704	
UAB " Alna litera"		35.1	3159	
Svencioneliu PK		19.18	1617	
Pociaus firma		142.03	12633	
Moletu PK		27.93	2328	
Lietuvos rasytoju sajunga		18.8	1316	
	" Dautekas"	35.5	2840	
	" Valmera" , Latvija	24.95	1790	
Is viso		2382.19		4000

AB "KLAIPEDOS KARTONAS" 1994 M. SUPIRKTOS MAKULATUROS KIEKIS

TIEKEJAI				
LIETUVOS FIRMOS	KITOS SALYS	KIEKIS (T)	VERTE (LTL)	1995M. POREIKIS (T)
1	2	3	4	5
BLR im. " Mida"		1.8	194.8	
UAB " Balcia"		1.4	186.2	
UAB " Banduziai"		1.16	81.2	
UAB " Klaipedos duona"		14.16	1670.8	
AB " Sanitas"		6.06	836.2	
VMPI " Gausa"		0.45	45	
Klaipedos el. tinklai		1.48	148.2	
Klaipedos 5-oji vid. mokykla		1.35	81.0	
Zaliakalnio vid. mokykla		2.3	138.0	
Klaipedos 16-oji vid. mokykla		2.15	57.0	
Silutes parnosu koop.imone		4.45	569.6	
Plunges vartotoju kooperat.		1.16	143.4	
Kretingos RVKS		12.69	1696.6	
LASS Klaipedos imone		3.3	330.0	
Smeltes vid mokykla		0.931	65.1	
Is gyventoju		3.8	380.0	
Is viso		58.64	6623.22	12000

AB "NAUJIEJI VERKIAI" 1994 M. SUPIRKTOS MAKULATUROS KIEKIS

TIEKEJAI				
LIETUVOS FIRMOS	KITOS SALYS	KIEKIS (T)	VERTE (LTL)	1995M. POREIKIS (T)
1	2	3	4	5
AB " Lietuvos tara" , Klaipeda		255	Metu pra-	
AB " Medienos plausas"		733	dzio je	
Spaustuve " Titnagas" , Siauliai		144	kaina	
Firma " Paulitas" , Kaunas		124	60-100	
KI Vilniaus paruosu real. baz		444		
" Standartu spaustuve" , Viln.		60	Metu pa-	
AB " Naujieji Verkiai"		1311	baigo je	
	Elgava,	91	kaina	
	Ryga,	738	100-200	
	Latvija			
Is viso		3900		12000

AB "KAUNO POPIERIAUS FABRIKAS" 1994 M. SUPIRKTOS MAKULATUROS KIEKIS

TIEKEJAI				
LIETUVOS FIRMOS	KITOS SALYS	KIEKIS (T)	VERTE (LTL)	1995M. POREIKIS (T)
1	2	3	4	5
Surinkta fabrike, is organizaciju, gyventoju (kiekiai iki 3 t)		107	3144	
Is viso		107		2000

VILNIAUS AB MEDIENOS PLAUSAS” 1994 M. SUPIRKTOS MAKULATUROS KIEKIS

TIEKEJAI				
LIETUVOS FIRMOS	KITOS SALYS	KIEKIS (T)	VERTE (LTL)	1995M. POREIKIS (T)
1	2	3	4	5
Lietuvos spaudos imones		480	45600	
Is viso		380		480

AB “GRIGISKES” 1994 M. SUPIRKTOS MAKULATUROS KIEKIS

TIEKEJAI				
LIETUVOS FIRMOS	KITOS SALYS	KIEKIS (T)	VERTE (LTL)	1995M. POREIKIS (T)
1	2	3	4	5
Lietkoopsajunga		3107	120.1	
Zaliava (Kaunas)		1414	90	
AB “ Lietuvos tara” , Vilnius		124	120	
AB “ Lietuvos tara” , Kaunas		99	120	
AB “ Lietuvos tara” , Panevezys		124	120	
VI “ Spauda” , Vilnius		109	120	
VI “ Viltis” , Vilnius		52	200	
PKB “ Punktukas” , Vilnius		79	120	
AB “ Darbas”		123	90	
Ind. im. “ Azuolyte”		247	95	
Kiti tiekejai		4034	120-90	
	Latvija	97	100	
Is viso		9609		15000

1994 M. POPIERIAUS PRAMONES IMONIU SUPIRKTAS MAKULATUROS KIEKIS

1. Lietkoopsajunga	5839t
2. Kitos imones	9712t
3. Importas is Latvijos	988t
Is viso	16539T

Makulaturos eksportas	7212t
Is viso	23751T

MAKULATUROS POREIKIS 1995 M. POPIERIAUS PRAMONES IMONEMS

1. AB “ Grigiskės”	15000t
2. AB “ Naujieji Verkiai”	12000t
3. AB “ Pabradės kartono fabrikas”	4000t
4. AB “ Klaipėdos kartonas”	12000
5. AB “ Kauno popieriaus fabrikas”	2000t
6. Vilniaus AB “ Medienos plausas”	480t
Is viso	45480T

Eil.Nr.	ATIEKEJAI	KIEKIS (T)	VERTE (LTL)
1	2	3	4
1.	Akmenės RVKS	19.9	Makulaturės
2.	Alytaus RVKS	342.3	supirkimo kainos
3.	Anykščių RVKS	28.5	buvo 0.03-0.05
4.	Biržų RVKS	79.5	LTL/kg
5.	Ignalinos RVKS	23.9	
6.	Jonavos RVK “ Jotrungė”	80.0	
7.	Joniskio RVKS	43.7	
8.	Juodpilių VK	0.4	
9.	Jurbarko RVKS	42.0	
10.	Kašiadoryų RVK	27.6	
11.	Kauno RVKS	791.1	
12.	Kelmės RVKS	38.0	
13.	Kėdainių RVKS	79.2	
14.	Klaipėdos RVKS	9.9	
15.	Kretingos RVKS	93.7	
16.	Kupiskio RVK	6.0	
17.	Lazdijų RVK	27.3	
18.	Marijampolės RVKS	145.4	
19.	Mazeikių RVKS	84.3	
20.	Moletų RVK	17.0	
21.	Nemėnės VK	7.5	
22.	Pakruojų RVKS	18.4	
23.	Pasvalio RVKS	45.4	
24.	Plungės RVKS	11.1	
25.	Prienų RVKS	27.8	
26.	Radviliskio RVKS	46.9	
27.	Raseinių RVKS	35.9	
28.	Rokiškio RVKS	65.7	
29.	Skuodo RVK	27.2	
30.	Sakių RVKS	16.0	
31.	Salcininkų RVKS	2.2	
32.	Siaulių RVKS	619.0	
33.	Silalės RVK	13.8	
34.	Silutės RVKS	60.0	
35.	Sirvintų RVK	18.8	
36.	Svencionių RVKS	64.3	
37.	Kelmės RVKS	57.0	
38.	Trakų RVKS	14.4	
39.	Ukmergės RVKS	33.7	
40.	Utenos RVKS	42.5	
41.	Varenos RVKS	42.0	
42.	Vilkaviskio RVKS	69.0	
43.	Vilniaus paruosu real. baze	1764.0	
44.	Klaipėdos paruosu real. baze	1286.0	
45.	Zarasų RVKS	31.6	
46.	Antr. žaliavų supirkimo im. “ Žaliava”	3016.3	
47.	Is viso	9416.2	

* Reuse of waste paper

The reuse of waste paper is generally regarded as increased availability of paper, and its positive aspects are emphasized. However, the increase in waste paper collected and recycled to the paper industry creates a new problem that has not been encountered previously. In fact, the paper industry has traditionally been

using waste paper for production of paperboards and decorative paper. On the other hand, paper mills have been relying on virgin pulp as a primary raw material for printing and writing paper. Naturally, the latter does not view waste paper as an essential input and is still reluctant to use it for production purposes. One of the reasons is the often-poor quality of waste paper. Today, the paper industry worldwide is demanded to consider the productive use of waste paper for all types of products in order to address the growing concern about resource conservation. In reality, however, quality of waste paper deteriorates with the increase in recovered volume and adversely affects quality of final products.

At the same time, mandatory recycling of paper containers and packages, which will be increasingly legislated in industrialized countries, will likely produce an ironical result, a significant decrease in production of container paperboards that consume low-grade waste paper in large quantities.

These moves will have negative impacts on private operators engaged in collection and recycling of waste paper.

To ensure the effective use of waste paper that is collected through the established channels, development of new applications is becoming very important. As production of paperboards is limited, high-grade paper demand can be exploited by developing a collection system for high-grade waste paper. Meanwhile, non-paper use of low-grade waste paper needs to be explored.

(3) Recommendations for improvement

a. Waste management in general

* Legislation

The waste management law should go beyond the recovery of reusable resources and should reflect the national policy for resource regeneration. Incorporation of such policy objective into the statutory law represents the government's determination to reduce wastes through promotion of resource regeneration.

In fact, such legislation has already become the world trend because waste reduction and resource regeneration are directly related to environmental

protection and preservation of natural resources and thus play a vital role in the future of the country and its population. In this recognition, the law is about to define the desirable roles of the country and people in every sector.

At the same time, however, excessive legal control of people's activities hinders the freedom of choice and may distort a market mechanism. Thus, the legislation on waste reduction and resource regeneration must be made carefully to reflect local conditions including behaviors of consumers and industries in response to regulatory control. For instance, the mandatory recycling of paper containers and packages needs to be considered by taking into account possible reactions by society and industry.

In Lithuania, the waste management law should include a declaratory provision to assume the government's responsibility for resource regeneration as part of public commitment to environmental protection and call for public awareness.

* Public administration and organization

The government is required to have the accurate understanding of the current status of waste management service performed by municipalities, provide useful advice and guidance, and mobilize resources required to assist them in achieving the statutory objective. As part of such efforts, the government should establish a coordinating body that facilitates communication and cooperation among ministries and agencies concerned. Such cross-disciplinary organization is essential in implementing the national project such as waste management and resource recycling.

At the same time, municipalities are expected to closely supervise day-to-day operations of waste management service, provide necessary information for the central government, including statistical data, and solve problems and address the needs for improvement, as they arise, on their own or under the government's support. In fact, information gathering and reporting to the central government form the basis of quick and timely problem solving that is often critical for the sake of safe waste management and public health.

Municipalities should also maintain good communication with field organizations, including private operators who carry out day-to-day collection,

transportation and disposal of wastes by furnishing information related to waste management and resource regeneration, including latest technology and know-how, in the form of education and training. They must ensure that the intent and purpose of waste management service is accurately understood by field organizations and workers and that field operations are carried in the most effective way to achieve the purpose. Good communication can be accomplished by two-way communication. By listening to what field organizations think and want, municipalities can provide effective support and assistance and ensure the maximum use of limited resources.

* Technology related to waste disposal

Today, a variety of waste disposal methods are adopted to make work at disposal facilities much more complex than before, especially the need for resource recycling. Modern waste disposal facilities must be equipped with a wide range of processes, including selection and processing. This means, municipalities must make capital investment to install new machinery and equipment and learn about machine operation and related techniques. In industrialized countries, new waste disposal techniques are urgently demanded and development efforts are underway, and the Lithuanian government should conduct research and study on the latest technology trends.

* Technology related to reuse

Resource regeneration is solely dependent upon availability of reuse. In Lithuania which does not have major industries consuming large amounts of resources, the bulk of manufactured products is imported, ranging from food, to household goods and industrial materials. Reusable wastes are generated and discarded. In fact, industrialized countries are facing the same situation and there is no immediate opportunity for Lithuania to promote reuse.

Industrialized countries are now striving to develop technology enabling the effective use of recyclable resources. (See general discussion on waste management in 12.2 (1)d.) As discussed in the section reviewing the present and the future of recycling technology, reconversion of a waste component to a material is only the beginning of the recycling process. Exports of a recycled material will soon be subject to a special tax or levy that covers the cost for regeneration. A workable solution for Lithuania should be developed by

capitalizing on its comparative advantages, namely low labor and land costs as well as highly educated labor force. Lithuania should develop regeneration technology that utilizes these assets effectively. By applying such technology to development of new products (or semi-finished), the country will be able to have a new export item. Needless to say, development of regeneration technology requires concerted efforts of universities, research organizations and industries, which should fully cooperate in information gathering and research activities.

* Others

Waste reduction and resource recycling projects can produce the maximum results only when they are properly carried out at the source where wastes are generated. In particular, cooperation of households and small enterprises – dispersed sources of general wastes – is the key to the successful waste management. In fact, industrialized countries, including Germany, France, the Netherlands and Japan, have obtained the favorable results only when general consumers are actively participated. On the way, they have had hard time in obtaining public understanding and raising awareness. The study team feels that municipalities in Lithuania have been making efforts to promote importance of resource recycling. Yet, the fact that they have not produced the notable results means they should try diverse methods for public campaign and should be patient until the general public receives and understands their message. By putting aside the budget constraint and the aftermath of the Soviet era, they should create an effective message from the viewpoint of what is important for the country and population and what benefits can be expected at what costs. Then, they should devise public campaigns to let people make an informed decision on what they should do about their own problem, not the problem to be dealt with by the government or industry alone. And the public campaigns should be carried out under the co-leadership of the central government and municipalities.

Resource generation is not a local issue but requires nationwide management. For this reason, municipalities are entitled to ask for strong leadership of the central government.

Finally, waste management accompanies sizable financial burdens and municipalities should consider joint efforts with neighboring municipalities. In Denmark, small municipalities jointly establish a waste management venture which is managed by municipality staff. Such innovative approach is required to minimize the cost while ensuring efficient and effective waste management.

b. Collection of waste paper

* Government action

Collection of waste paper in Lithuania has been developed as a viable business over a long history, during which private operators devised various systems according to the needs of the times and to reflect supply and demand. The system is now facing difficulty due to the changes in government policy, for which waste paper suppliers are not to be held responsible. Moreover, waste paper is sold at very low prices compared to other reusable resources and is generated constantly in large quantities, making demand control difficult. For this reason, most industrialized countries provide financial assistance for smooth recycling of waste paper (which is segregated from general wastes) because waste reduction creates various benefits for government that assumes responsibility for waste management, including cost saving that is realized by letting the private sector operate the cost effective system. Thus, financial assistance can be justified by the fact that the effective use of tax money is assured. In Lithuania, the law authorizes public financial assistance for waste management if the need arises. Municipalities complain about the shortage of fund, budget allocation is presumably made under the law. However, its disbursement is not documented or disclosed, including actual recipients. It is understandable that the government is hesitant about providing financial assistance for private enterprises, which may have unforeseeable impacts. However, public financial assistance is acceptable so far as it is justifiable, as discussed above. If it is difficult to provide financial assistance for individual enterprises, it may be provided in the form of reward to local residents who sort and separate waste components, or community organizations, volunteer organizations, schools, churches and philanthropic organizations. Actually, the latter case, in the form of subsidy, is seen in various countries. It is quite natural for modern democratic countries to spend public money in the most efficient and effective way so far as it is make known to the public for review.

Not to mention the statutory budget allocation that should be spent as mandated by law.

Waste management costs and their sharing become an important issue in any country. As the scope of waste management extends to every corner of society, it is logical to conclude that its cost must be borne by beneficiaries. And the fair sharing issue is solved by distributing the cost according to the volume or quantity of waste. This cost sharing scheme provides incentives for consumers and other sources to reduce wastes and use them as recyclable resources as far as possible, including separation of waste components, which would lead to higher quality of recycled resources. Needless to say, it must be accepted by the general public and the disclosure of waste management costs is the prerequisite to public acceptance.

* Collection system and organization

The waste paper collection systems operated by private enterprises in Lithuania are considered to be achieving the high levels of efficiency and effectiveness equivalent to those in industrialized countries in terms of efficiency and effectiveness. In particular, the formation of the cooperative, collection at individual points or stations, and the exchange with gifts such as household goods are highly innovative and well operated. They were short-lived due to the weak industrial base but can be resumed if the market shows recovery.

The collection system should shift its focus to high grade waste paper that is generated from business establishments, retailers and office buildings, for this type of waste paper is currently used as a raw material for low-grade paper or is disposed by incineration. Collection is already made by collection companies or paper manufacturers from government offices and other sources that generate the large quantity of waste paper. Although the result is not uncertain due to the lack of public awareness, the government will soon extend regulatory control to waste paper from these sources, as done in many industrialized countries. By establishing the partnership with the government, the industry will be able to explore the new business opportunity. As for households, efforts should be made to encourage volunteer activities by non-profit organizations to collect and sort high-grade paper, which is now mostly discarded without proper separation. This way, cost-effective

collection can be made. Candidate organizations range from traditional organizations which have been earning some revenues from waste collection in many countries, such as churches, women's associations, boy scout associations, schools and charitable organizations, to residential complexes that are motivated to cover part of building maintenance costs.

For waste paper suppliers, the partnership with these organizations would help them to go through the unfavorable market conditions, as the organizations act as pressure groups for the government and the paper industry to continue collection service.

Overall, it is highly rewarding for suppliers to build the relationship with the general public including non-profit organizations, which will be as important as the organization of private operators for the future collection systems.

* Technology related to waste collection

Quality seems to be the most important issue for collection of waste paper. Segregated collection needs to be enforced under the close communication and cooperation with the government, including a strategic approach to focus on correction of regional variation. It is important to avoid monetary compensation to encourage voluntary separation at the source and to promote the public understanding gradually by emphasizing that effective waste treatment benefits everyday life. At the same time, a fair price should be paid for resources that have a marketable value.

In industrialized countries, collection vehicles are increasingly modified to have different compartments for separated waste paper. Where modification is not feasible, workers are instructed to load different types of paper separately. In Lithuania, originally separated waste paper is smeared or mixed with other types of paper at the collection operator's facility or the paper mill's yard. This clearly indicates the lack of quality awareness and hinders production of high-quality products. Proper handling of waste paper affects transportation and inventory costs. Clearly, the collected or sorted paper needs to be packed in a compact form, an important factor for maintaining good product quality. Careful handling is feasible when the monthly volume reaches 500 tons, which is considered to be the breakeven point for the business. As discussed later,

collective operation by a number of private operators is expected to cost justify the use of a packaging press that is capable of compacting an one-ton package. This prevents packaged paper to collapse, minimizes storage space, reduces transportation costs, and ease quality and inventory control. Given these benefits for paper mills, collection companies can charge the price that includes the packaging cost. Note that the press-compacted paper equivalent to 22 tons can be stacked in a 10m² space, and collection operators require large forklifts to handle these packages.

* Sales

Most waste paper collected in Lithuania is corrugated cardboard and the mix. This means, the market mostly handles lowest-grade paper that is traded at the lowest price level among other types of paper. High-grade waste paper represents some portions but is considered to have quality close to the mix and therefore priced at the level 20% higher than that of corrugated cardboard. In fact the price level is one half that for computer printout paper traded in France and Germany. Thus, high-grade waste paper in the country is traded at one half the market price. This seems to partly come from poor quality and partly because of the lack of demand for high-grade paper. At present, it is difficult to collect high-grade waste paper in large quantities, so that suppliers need to sell it for higher value added use.

Also, purchase prices for newspaper, corrugated cardboard and the mix vary largely among paper manufacturers. In addition to geographical distance, this may come from variation of negotiating power among suppliers.

In the future, suppliers need to gain market power to control supply in order to maintain market prices at reasonable levels. At present, waste paper is rated according to the EU' s quality standards, which are very detailed. Suppliers should make efforts to obtain high rating by maintaining good quality. They also improve export quality to ship their products to the international market at favorable prices.

c. Reuse of waste paper

* Reuse of waste paper

Partly because types of products traded are fairly limited, both suppliers and buyers do not have much concern about quality control of waste paper. In fact, the lack of quality awareness is conspicuous despite of the fact that they mostly trade corrugated cardboard and decorative paper. For the paper industry that is still in recession, it is a logical choice to maintain or improve product quality, which starts from quality control of raw materials. It is unimaginable to survive the recession by cutting the costs related to proper production management or supplying low-grade products at lower prices. Suppliers must share responsibility by failing to provide products of best quality. If the situation continues, Lithuania will lose reputation for quality of waste paper it supplies. Suppliers must keep confidence and pride in their own products. This is the professionalism that forms the foundation of every industry and its people. If waste paper suppliers abandon the professionalism, their market will be eroded by new entrants from other industries, who find an opportunity in the market driven by the need for resource regeneration, while seeing little entry barrier of production expertise. The waste paper industry has a long history through which it has built up unique knowledge and techniques, which enable suppliers to meet the customers' needs in terms of stable supply and quality.

Manufacturers strive to supply products of the highest possible quality by applying their best ability. In particular, they are highly vigilant of raw materials and their quality control. What they are doing is very straightforward, down-to-earth, and best practice. They set clear quality standards under agreement with suppliers. They check product quality upon delivery, including sampling inspection for a specific period. A Japanese manufacturer, which consumes a few ten thousand tons of raw materials, check external appearance, disassembles several pressed samples and measure the amount of impurities. If a sample exceeds an allowable limit or contains a foreign matter that is not acceptable, its supplier receives warning. A supplier who receives repeated warnings is suspended. Inventory is controlled by keeping each type of product in a specific location and is updated all the time. Products are used as first-in-first-out basis and warehouse layout is designed to allow such inventory control. It is expected that each product that is shipped

out from the warehouse can be identified with its source and warehousing time, allowing the manufacturer to trace any defect back its origin. To assure the traceability, some manufacturers require suppliers to attach quality guarantee cards to products. The whole system may be cumbersome, but it is an effective means to assure product quality.

Finally, the saving of raw material cost does not always bring profits. Cheap raw materials often accompany unforeseeable loss.

* Product and quality

Waste paper is used for production of various paper products, including corrugated cardboard, decorative paper and newspaper. Recently, printing and writing paper uses high-grade waste paper, and an increasing number of countries require every paper product to contain a specific percentage of waste paper, especially paper used at government office. To maintain product quality while using more and more recycled paper, quality of waste paper must be raised.

While the final goal is to make high quality paper by using low-grade materials, it is not feasible, at least at present.

In addition to the stricter quality requirements, suppliers must address the issue of the increase in waste paper of mixed quality that is generated from small sources as a result of waste reduction. It is important to ensure the effective use of the mix that would otherwise be disposed due to the quality problem. To avoid the overburdening of suppliers with unusable waste paper, as occurred previously, efforts are underway to develop non-paper applications. As pointed out earlier, the paper container and package recycling law, against its intent, works to restrain production of paper containers and packaging materials. On the other hand, low-grade paper is primarily used for production of paperboard, which is in fact used to make containers and packaging materials. The dilemma has to be solved by using low-grade waste paper for non-paper uses. In Japan, waste paper distributors have formed a joint venture to develop new applications, and a number of products have been commercialized and introduced to the market. Nevertheless, such waste paper-based products

often require good quality to ensure product quality, safety and public health, so that suppliers are not free from quality assurance of their products.

As the standard of living rises or high quality of living (emphasis on cultural aspects) is demanded, consumers want higher quality of products they use. Unlike the market with limited selection of products, consumers want every product of better design and quality. The consumer's taste changes (or evolves) in a way that is not motivated by economic sense, necessity or the sense of obligation. As for paper products, consumers want decorative paper, notebooks and cards. Manufacturers must develop products that satisfy the contemporary or future needs of consumers. Public demand for use of recyclable resources and the consumer's insatiable taste for high quality products seem to be in a trade-off from today's technology point of view, future technology must achieve the two different goals at the same time, although resources must meet the specific levels of quality requirements. Paper manufacturers are expected to create new products that can serve as new materials by meeting the changing needs of the times. At the same time, waste paper suppliers must be responsive to the needs of their customers.

* Marketing strategy

The primary purpose of any business enterprise is to earn profits in return for its economic contribution to society and develop its business on a sustainable basis. To achieve it, the business enterprise must strive to build up the robust corporate structure including the healthy financial base. Without it, a marketing strategy becomes meaningless and cannot produce any results. In particular, materials industries can no longer expect long-term prosperity as their products have become ubiquitous commodities that are subject to price volatility in the international market. As a result, they have to make continuous efforts to make their business viable, such as rationalization and quality control, and develop ideas and resources to make a new challenge, e.g., product development. However, the study team has found that most paper companies in Lithuania do not make such efforts nor have the willingness to make a challenge or explore an opportunity. Analysis of the business environment facing the Lithuanian paper industry indicates that general conditions are unfavorable for the industry to pursue mass production strategy that is considered to be the axiom for success of capital-intensive industries

including the pulp and paper industry. In fact, there are paper makers that make profits by choosing a strategic direction opposite to the axiom. They have successfully developed specialty products which features unique designs that cannot be easily matched by mass producers and are priced much higher than ordinary commodity products. These companies have invariably followed the elaborate product development process. They first identify candidate products in the market, which can be made of paper (including those that are currently made of paper but require refinement). Then they talk with customers (distributors) and end users to hear requests for quality and other improvements and study feasibility of such improvements. They develop prototypes, sometimes jointly with customers, and test market them for final selection. Thus, product development is a company-wide effort involving not only the management, but marketing staff, production engineers, and sometimes field workers. In addition, it is a joint project participated by the maker, the distributor and the consumer - each contributes its idea, desire and demand. A new product so developed reflects them in its design, quality and price. It therefore delivers a tangible value to each party. In today's market economy, no manufacturer can sell its product to consumers by merely placing it at storefront and setting a price of its choice, unless it has strong market power. Market power does not mean coercive power, but the ability to entice consumers. The product must provide a value to the buyer – benefits that may be tangible (convenience) or intangible (comfort) – which is unrivaled by competitors. It then generates profits. The study team believes that it is time for paper manufacturers in Lithuania to make a challenge to product development, which will open up an opportunity for their future growth. Then they should mobilize all the resources on the basis of the firm commitment by the management and the workable business strategy.

In industrialized countries, a new technological revolution is underway. It demands new materials. At the same time, environmental and other concerns raise the question about the plethora of plastic materials. These moves favor development of new applications for paper products. In addition to the high-tech fields, opportunities exist in products having an aesthetic appeal or a touch of class, which may target specific demographic groups (e.g., children or women). The specialty product or the customized product has a high prospect for success in the domestic market that is fairly small. And it should be reiterated that marketing strategy must be founded upon the firm business

strategy: the management must take leadership in the entire product development process because its success determines the future of the company.

* Commercialization

In consideration of the current state of the paper industry, a new project – be it a mass-produced, commodity product or a small-lot, specialty product – will create heavy burdens in terms of capital requirements and technical capabilities. A workable solution is to enter into alliance with other companies in the form of equity participation, technical assistance or joint venture in order to facilitate product development and/or market exploration. Potential partners include competitors, related industries (e.g., printing and publishing) or even other industries that possess technical or marketing expertise. The so-called strategic alliance may not be a comfortable option for paper companies to adopt, but it is worth consideration for the industry which apparently needs a new idea and input to create a future vision, including drastic restructuring. To grab the new opportunity that emerges in the world, the management has to make strategic decision on the basis of the sound assessment of the future trends.

* Corporate management in general

This section has discussed a number of issues that touch upon the foundation of corporate management. Finally, brief discussion should be made on “human resource” aspects of business operation.

General education in the country is not the scope of the study, and the study team has little knowledge on the country’s educational system, as to how well it is functioning. Nevertheless, quality of education is directly related to quality of work force in any country and determines the future of the country. For instance, Japan has grown to a major economic power largely because of its excellence in mass education. Prosperity and affluence brought by the economic success, however, are degrading work ethics through dominance of materialism, which is in turn adversely affecting quality of general education - which the country has long vaunted. If quality of education deteriorates further, it will threaten the future of the country. It is not an immediate threat but it is looming. Thus, education can underpin or undermine the economic foundation of the country.

As general education helps to form the skeleton of the country, employee education plays a crucial role in determining the long-term growth potential of the business enterprise. The economic success in Japan is directly attributed to voluntary efforts of individual enterprises to raise productivity through extensive employee education. In the process, corporate managers stood in the front line. They first learned about knowledge and techniques for productivity improvement. Then they invested considerable time, effort and money to diffuse them to every and each employee. And they were rewarded with positive outcome and Japanese manufacturers became global names. Today, the same companies are criticized for unethical behavior. One of the reasons comes from the lack of employee education on work ethics. They grew overconfident from the hard-earned prosperity, went astray and neglected importance of education, more precisely being the learning organization. Japanese companies are now challenged to launch new employee education that meet requirements in the global age. Again, education can underpin or undermine the corporate foundation. In any case, it is noteworthy that successful education has brought many Japanese companies to commercial success.

Employee education is nothing difficult and does not require fancy techniques. It starts at the top, the changes in mindset and attitude of the management. Before the war, Japanese companies dealt with their employees under the doctrine of “they are not to know but to obey.” They did not want their employees to know about what the management was doing but just want them to obey the order. The government took the same attitude to people. This despotic top-down approach led the country to the war.

It should be emphasized that, although management education is not discussed in detail here, to change the mindset of the management should be given of highest priority. In fact, this report contains a number of recommendations for leaders in the government and industry to realign their philosophy and thought with economic realities, especially the increasingly competitive business environment and the need for farsighted visions for future development.

The major pillar of employment education is to make employees realize that their commitment to the company's operation and growth leads to the

improvement of working conditions and the better standards of living for themselves and their families. This means, employees must develop the sense of participation in corporate management, rather than a traditional sense of labor under contractual obligation – a firm belief that their work contributes to the company's growth. The sense of participation, however, does not grow unless the management has the sense of responsibility and pride for what they are doing. The successful company has the best practice: every member, from president to field workers, assumes responsibility for work assigned to him and thinks about how he should work to make his company better, which makes himself happy. The successful company provides employees with necessary information to think about the betterment of the company's operation, including productivity improvement and cost reduction. The successful company has group leaders who can provide effective guidance for subordinates and experts who learn and maintain latest knowledge in various fields as well as analytical skills and problem-solving capabilities. All these best practices can be learned through systematic education that is conducted from the long-term perspective and should cover every employee according to the skill level. The management should participate in the learning process by taking the front-line position and trying to communicate their intent and vision to employees. This modified top-down approach (direct involvement of the management) was widely adopted by Japanese large corporations with successful results and was quickly spread to the U.S. and Europe. Naturally, the approach should not be followed exactly in an original form. Rather it can be modified to reflect local conditions, cultural aspects including the trait and tradition. Also, each company can invent its own implementation method according to its corporate culture. The core element of the approach is the convergence of company-wide efforts, resources and wills towards the achievement of a common goal. This requires a mutual trust among participants, especially between the management and workers. And education plays a crucial role in helping all employees to understand and share the goal and to perform their everyday work under strong motivation to achieve it.

Clearly, this is a highly abstract concept that requires a specific mental attitude and a specific way of thinking. It is difficult to adopt and implement the idea over night. Nevertheless, it is a true driver to change the industry in a better way and in a desirable direction. It will create the extended team spirit that

embraces the entire company and its employees and will underpin other efforts
– practical techniques and skills – to produce fruitful results.

12.3 Conclusion

Lithuania needs to find appropriate methods for waste management, and recycling and reuse of resources, which are optimized to local conditions. While the basic law may contain fairly standard provisions, it should accompany regulations that set forth operation rules to meet the local needs. They can be accepted by other countries so long as favorable results are obtained. At the same time, the government must take responsibility for consequence of the legal system it establishes, regardless of its origin. Also, it must realize that the legal effects will continue well in the future. As seen in any system, the waste management system produces both benefits and losses to affected parties, which must be addressed by the government as the representative of the public sector responsible for such service.

In this connection, the environment and natural resources are public goods that are jointly owned by entire population, who share responsibility with government for their management and disposal. The government should therefore make it known to the public that the consequence of any activity related to management of the environment and natural resources affects everyday life of people and their future. This means, the government is responsible for informing the general public of the current state of waste management in and outside the country, including the future outlook, so as to give an opportunity for people to learn about what is going on and what should be done, and extend cooperation and assistance.

Such efforts should be joined by all the industries involved in waste management and resource recycling, who should actively seek the way to achieve the common goal agreed with all the parties.

Lithuania is in transition to a market economy and industrialization. It has great potential to transform itself to a country that has comparative advantages over industrialized countries. As discussed earlier, the leadership is the key to successful concentration of national resources and wills. Political and economic leaders, among others, are expected to show their commitment and enthusiasm which will help unleash potential power the young nation has.