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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

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APPRAISAL OF POWER AND WOODWORKING INDUSTRY PROJECTS

IN

FINLAND

March 7, 1955

**FILE COPY**

Department of Technical Operations

### CURRENCY CONVERSION

\$1.00	=	230	F.M.
\$1.00	=	5.17321	Swedish Kr.
\$1.00	=	4.286	Swiss Fr.
\$1.00	=	350	French Fr.
\$1.00	=	4.20	D.M.
\$1.00	=	.357143	£ Sterling
\$1.00	=	6.907	Danish Kr.

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APPRAISAL OF POWER AND WOODWORKING INDUSTRY PROJECTS - FINLAND

SUMMARY

This report gives an appraisal of two electric power industry projects and of five woodworking industry projects which form the basis for a proposed loan to Bank of Finland.

The power projects consist of a hydro plant with a capacity of 100,000 kw and a thermal plant with a capacity of 30,000 kw. A total allocation of \$4.2 million of the loan is proposed for these two projects.

The five woodworking projects appraised vary in character. In two cases, major expansions of sulphate pulp and kraft paper capacity are proposed for financing. In the other projects, the investments to be financed are in the nature of replacement and modernization of existing facilities, supplemented in some cases by equipment designed to economize the use of imported fuel and to utilize chemical residues hitherto unrecovered. While there will be some increase in productive capacity as a result of these latter projects, the major benefits anticipated are increased operating efficiency and reductions in unit costs. The five projects involve a total allocation of \$7.8 million equivalent, which includes an unallocated contingency reserve of \$0.5 million.

Part A of this report contains an appraisal of the electric power projects, Part B an appraisal of the woodworking industries projects, Part C contains a short description of the progress of the electric power and woodworking industries projects financed by previous I.B.R.D. loans to Bank of Finland. Progress on the power projects has been satisfactory. On the woodworking projects the physical progress has been good but a few of the companies involved have experienced financial difficulties. The woodworking companies which would be the beneficiaries of the proposed loan are not likely to face similar financial difficulties.

PART A

POWER PROJECTS

General

1. Two power projects have been submitted to the Bank for consideration, the Petajaskoski Hydroelectric Plant and the Vaasa Thermal Power Plant. Both projects were included in the power expansion program partly financed under the loan made on April 30, 1952 and received a total allocation of \$9.5 million. The program included the construction of four hydro power plants, one thermal power plant and a number of transmission lines. The execution of the program has been progressing satisfactorily.

2. The requested additional allocation of \$4.2 million equivalent out of the proposed loan will help finance the major share of the foreign exchange required for the completion of the two projects. The following table furnishes a breakdown of the financing, by currencies, proposed for each of the power projects. The reason for dividing the allocation on the Petajaskoski project between two firms will be apparent from para. 16 below.

<u>Project</u>	<u>German Marks</u>	<u>Swedish Kronor</u>	<u>Swiss Francs</u>	<u>British Pounds Sterling</u>	<u>Danish Kronor</u>
	(in millions)				
Petajaskoski	<u>4.65</u>	<u>5.20</u>	<u>5.30</u>	-	-
(a) Kemijoki	4.65	3.65	3.50	-	-
(b) Imatran Voima	-	1.55	1.80	-	-
Vaasa	<u>2.89</u>	-	<u>0.20</u>	<u>0.018</u>	<u>0.45</u>
	7.54	5.20	5.50	0.018	0.45
\$ Equivalent Total 4.2	1.80	1.01	1.28	0.05	0.06

3. The following table summarizes previous Bank lending on Finnish projects:<sup>1/</sup>

<u>Loan</u>	<u>Date</u>	<u>Allocation \$ million</u>	<u>Disbursements \$ million January 25, 1955</u>
16 FI	August 1, 1949	1.75	Fully disbursed
61 FI	April 30, 1952	9.50	6.8

<sup>1/</sup> Part C includes a summary of the status of the major power projects previously financed.

## Petajaskoski Hydroelectric Power Project

### Introduction

4. The project is for the construction of a hydroelectric power plant at the Petajaskoski Rapids on the Kemi River. It will have a generating capacity of 100,000 kw and will be directly connected into the national power grid. It will operate at a relatively high load factor because of the predominantly industrial load on the grid.

5. The allocation to this project under the earlier loan amounted to \$2.01 million and covered mainly the purchase of construction equipment and machinery. The allocation under the proposed loan amounts to \$3.35 million bringing the total to \$5.36 million or about 16% of the total estimated cost of the project.

### Kemijoki Oy

6. The project (apart from the Pikkarala substation mentioned in paragraph 16 below) will be carried out and operated by Kemijoki Oy, which is closely associated with Imatran Voima Oy, the major utility company in Finland. Kemijoki Oy was established in November 1954 with a share capital of F.M. 800 million (\$3.47 million) which is fully paid in. The Government holds 65.01% of the shares, Imatran Voima Oy 32.32% and Veitsiluoto Oy, a Government-owned woodworking company, 2.67%.

7. Kemijoki Oy will develop the hydroelectric power potential of the Kemi River estimated at about 600,000 kw, representing the largest undeveloped source of hydroelectric power in Finland.

8. Integrated development was complicated because the water rights to different parts of the river were held by several parties, including government institutions, private companies and individuals. (The rights at the Petajaskoski site were held exclusively by the Government and Imatran Voima Oy.) To solve this problem the Government decided to establish Kemijoki Oy to carry out the development and the necessary legislation has been approved. This legislation provides for the transfer of the publicly owned water rights to the company and gives private owners the choice between participation in the new company, exchange for rights in other rivers or outright sale. A minimum of 51% of the share capital must be held directly by the Government at all times.

9. The management of Kemijoki Oy will be recruited from the executives of Imatran Voima Oy. Kemijoki Oy will have only a small staff; the engineering and construction work will, as at present, be carried out by the staff of Imatran Voima Oy for the account of Kemijoki Oy.

### The Project

10. The project is located on the Kemi River about 50 miles north of the town of Kemi on the Gulf of Bothnia. It will be of the run-of-the-river type with storage for daily regulation. Recorded stream flow data are available for the past 30 years and show an average minimum flow of 330 cubic meters per second, assuring a firm capacity of 100,000 kw at 55% load factor. The plant is, however, designed for a maximum installed capacity of 150,000 kw because of existing plans to construct additional storage facilities upstream, which will increase the average minimum flow to about 500 cubic meters per second.

11. The regulation dam across the main river will be constructed of earth with a concrete spillway section and will give the plant an effective head of 20 meters.

12. The powerhouse will be constructed across a branch of the river and arranged for the installation of three 50,000 kw generating units, of which two will be installed at the present time. An outdoor substation will be provided.

13. A 150 km double circuit transmission line will be constructed to connect the plant with the national grid operated by Imatran Voima Oy. This company will construct the line and the associated receiving station which are already included in the transmission line program partly financed under the earlier loan. In addition a portion of the new loan will be used for this part of the project. The design, engineering and construction of the project will be carried out by Imatran Voima Oy. The personnel of this company has gained a wide experience through construction of plants of similar type and is fully capable of carrying out the project.

### Present Status of the Project and Schedule of Construction

14. Preliminary work on the project was started in February 1953. At the end of 1954 the preliminary works were largely completed and construction of major structures was well under way. The first unit is scheduled to start operations in the beginning of 1957 and the second unit at the end of that year.

15. Orders for major pieces of equipment are being placed, based on bids invited on an international basis.

### Construction Cost

16. The present estimated cost of the project is given in Annex A-1. The total cost is estimated at F.M. 7,623 million (\$33.0 million), of which F.M. 1,432 million (\$6.2 million) represents the estimated cost payable in foreign exchange. The allocation to the project from the proposed loan amounts to \$3.35 million. Included in this amount is \$580,000 representing the cost of substation equipment which will be installed at the Pikkarala substation, where the transmission line from the Petajaskoski plant will be connected to the national grid. This substation will be built and owned by Imatran Voima Oy.

17. The list of equipment to be financed under the proposed loan is given in Annex A-2. The balance of the foreign exchange required will be made available by the Bank of Finland. The cost estimate includes interest charges on borrowed capital during construction estimated at 8% on domestic loans and 4-3/4% on the IBRD loans and a sales tax which amounts to 25% of the purchase price of the equipment. No credit has been taken for the estimated salvage value of the construction equipment amounting to F.M. 460 million.

18. The actual cost of construction work carried out as of September 30, 1954, amounted to F.M. 1,820 million.

19. The cost per installed kw amounts to the equivalent of \$330. This includes the cost of civil works to be carried out in connection with the later installation of a third generating unit. This cost is reasonable.

### Financing

20. Most of the funds required for the construction of the project have already been raised by loans from government institutions (mainly from the National Pension Fund, the Postal Savings Bank and the Government Unemployment Fund). Details of these loans are shown in Annex A-4. They carry an interest rate of 8%. Some are to be amortized over 15 years and others over 25 years. The Kemijoki Oy has discussed with the same institutions the possibility of raising by further loans the funds required (on the basis of present cost estimates) to complete the project. An informal agreement for loans to provide these funds has been reached.

### Power Market

21. The Petajaskoski plant will be connected to the national transmission line grid operated by Imatran Voima Oy. This company will purchase all the power generated at the low tension side of the step-up substation of the plant. The construction program, including the Petajaskoski plant, which at present is being carried out by Imatran Voima Oy and associated companies, will increase the capacity of the grid from 875,000 kw in 1954 to 1,210,000 kw in 1958, corresponding to a power production of 5,100 million kwh and 7,050 million kwh in the respective years under average water conditions. The total energy consumption, which over the last five years has increased annually by about 10%, amounted to 4,750 million kwh in 1953. Even by estimating a more modest increase of 8% over the next five years, the consumption will reach 6,900 million kwh in 1958. Additional generating capacity will, therefore, be required in 1959.

### Power Rates and Production Costs

22. With the plant fully loaded, the net annual power production will amount to 480 million kwh, based on an average load factor of 55% in the grid operated by Imatran Voima Oy. The annual production cost, not including interest on borrowed capital, is estimated at F.M. 320 million, resulting in a unit cost of F.M. 0.67/kwh (US \$ 0.3), which is considered reasonable. The rate to be charged by Kemijoki Oy will be determined so as to provide the

company with sufficient income to cover production costs and interest and amortization payments on the borrowed capital. It is at present estimated at F.M. 1.80 per kwh but is subject to adjustment according to agreement between Kemijoki Oy and Imatran Voima Oy.

### Estimated Financial Results

#### Estimated Earnings

23. A statement of the estimated operating results of the company for the period 1957-71 is presented in Annex A-3.

24. This forecast shows that for the first three years of operation (1957-59) the net income from operations will just cover interest charges on the loan capital. Starting in 1960, however, the operation will show a small net profit which should increase steadily with the years. In 1971 interest should be covered 1.8 times.

#### Cash Position

25. A forecast of the company's receipts and expenditures for the period 1953-71 is given in Annex A-4. This shows that the cash position will be tight over a number of years. While the rate assumed for the sale of power will provide sufficient revenues to meet all cash requirements including debt service, no margin will be available. The company states that the rate of F.M. 1.80 is conservatively estimated and that it is possible a higher rate will be established when the plant starts operations.

#### Pro Forma Balance Sheet

26. A pro-forma balance sheet as of the end of 1957 is shown in Annex A-5. Total assets are estimated at F.M. 8,144 million and include an amount of F.M. 460 million representing the estimated residual value of construction equipment and materials in stock. Long term debt amounts to F.M. 7,344 million representing 90% of total capitalization. The balance sheet does not include any current assets and liabilities, as they cannot be estimated with any degree of reliability.

### Conclusions

27. This is a relatively low cost hydroelectric power project which will provide additional capacity required by the national grid serving the major part of Finland. It is sound and cost estimates are reasonable. The company in cooperation with Imatran Voima Oy will have a capable management and staff to execute and operate the project.

28. This project is considered suitable for an allocation of \$3.35 million of the proposed loan to the Bank of Finland of which for:

Kemijoki Oy	\$2,770,000
Imatran Voima Oy	<u>580,000</u>
	<u>\$3,350,000</u>

## Vaasa Thermal Power Project

### Introduction

29. The project includes the construction of a thermal power plant at Vaasa which will have a generating capacity of 30,000 kw. The plant will operate at a lower load factor than the Petajaskoski plant because of different load characteristics. The project will be carried out by Etela-Pohjanmaan Voima Oy (South-Ostrobothnian Power Company), a company owned by the principal municipal and rural power distribution companies operating in the area. Under Loan 61-FI, made on April 30, 1952 \$610,000 was originally earmarked for construction of this plant. Mainly due to financing difficulties, the company found it necessary to postpone the construction of the thermal plant, but as it was successful in negotiating a four-year contract with Pohjolan Voima Oy (North Finland Power Company) for supply of hydro power to the Vaasa area, construction of the new steam plant became less urgent. The company, therefore, gave priority to the construction of substations and transmission lines, and the Bank agreed to the use of part of the allocation under the loan made on April 30, 1952 for this purpose. As the remaining part of the allocation (\$255,000) will cover only about 18% of the estimated foreign exchange cost of the thermal plant, the Bank of Finland has asked the Bank to consider an additional allocation of \$850,000 under the proposed new loan.

### The Company

30. Etela-Pohjanmaan Voima Oy was established in 1952 with a share capital of F.M. 120 million (\$520,000). The shareholders consist of eight power distribution companies owned by municipalities and rural cooperatives. The purpose of the company is to provide its shareholders with a firm supply of power partly by its own generation and partly by purchase of hydro power.

31. The company is being managed jointly with the Vaasa Municipal Power Company, the major shareholder. The management is well experienced and qualified to carry out construction of the project and to operate it after completion.

### The Project

32. The site of the proposed steam power plant is located close to the Vaskiluoto harbor of the town of Vaasa. A long term lease on sufficient land to provide for future expansion has been given the company by the Vaasa Municipality. The harbor is served by railroad and road.

33. The plant to be constructed will be of conventional design and will have a generating capacity of 30,000 kw. An outdoor step-up substation will be constructed and a 2.7 km 110 kv transmission line will connect the plant with the existing thermal power plant in Vaasa.

34. The engineering and design of the plant has been made by EKONO (Power and Fuel Economy Association of Finland). This Association has an experienced engineering staff which also evaluates tenders for delivery of equipment and supervises the construction work.

#### Schedule of Construction

35. Tenders have been received on the basis of international bidding for the major pieces of equipment required and, based on the delivery times quoted for the turbo generator and boiler, the construction time is estimated at about 30 months. The plant should, therefore, be ready for operation in the last half of 1957.

#### Construction Cost

36. The total cost of the project is estimated at F.M. 1,247 million, equivalent to \$5.4 million, of which the equivalent of \$1.24 million would be in foreign currencies. Of this amount the Bank has been asked to finance \$1,105,000 including the \$255,000 allocated to the project under the loan of April 1952. A breakdown of the estimated cost is given in Annex A-6, and the list of equipment to be purchased with the proceeds of the proposed loan is given in Annex A-7. The cost per installed kw amounts to \$180, which is reasonable for a thermal plant of this size.

#### Sources of Funds

37. The funds required for the construction of the project, in addition to those raised by the issue of share capital and by the IBRD loans are to be obtained by loans from the National Pension Fund, the Postal Savings Bank and commercial banks. These loans carry an interest rate of 8% and their term is 15 years. Details are shown in Annex A-10. A small amount of money should be available from earnings during the last year of construction. Most of the local currency loans have already been raised and an informal agreement for loans to provide the balance has been reached.

#### Market and Supply of Power

38. The area which will be served by EPVO is less than 2% of the total area of Finland, but has nearly 10% of the population. About 50% of load is industrial; the main industries are textile mills, shipbuilding and manufacturing of electric motors and appliances, mainly located in the town of Vaasa. The surrounding districts are among the richest agricultural areas of Finland.

39. The consumption of electric power has over the last ten years increased by about 10% annually and reached 95 million kwh in 1953 with a peak load of 23,000 kw. With the same rate of increase, the power demand in 1958, when the new plant is scheduled to start operations, is estimated to be 112 million kwh with a peak load of 37,000 kw. In addition to insuring the shareholders of EPVO a firm supply of power, the new plant will also add about 10%

to the total thermal generating capacity in Finland and will, therefore, after the plant is connected to the national grid in 1960, help to alleviate the power shortages in periods when very low water availabilities will reduce the production of hydro power.

40. At present the shareholders of EPVO are supplied with hydro power from Pohjolan Voima Oy (North Finland Power Company), each under a separate contract. In addition the Vaasa Municipal Power Company is operating an existing 12,000 kw steam plant. The contracts for hydro power expire at the end of 1955 and the supply of power will then be taken over by EPVO, which has negotiated a new contract with Pohjolan. This contract covers the period 1956-60 and provides for a capacity of 20,000 kw, liable to a maximum reduction of 20% in case of drought. Peak power will be purchased from the old municipal plant in Vaasa. In 1958, when the new plant comes into operation, this old plant will be used as standby. By 1960 the EPVO grid will be connected directly with the Imatran national grid. EPVO will then purchase non-firm hydro power from this source and cover the peak load from its own plant.

#### Power Rates and Production Costs

41. Based on a load factor of 40%, the annual cost of operation of the thermal plant is estimated at F.M. 420 million, resulting in a unit cost of F.M. 3.90/kwh (US \$ 1.7), which is reasonable. The estimated rates at which the company will sell power wholesale to its shareholders as well as the rates at which the company will purchase power are given in Annex A-8. They consist of an annual charge for each kw connected load in addition to the unit price for delivered energy, which is the common practice in Finland.

42. The sales rates will provide the company with sufficient receipts to cover all operational disbursements including debt charges and leave a small balance for each year. The annual operational costs of the transmission system, estimated at F.M. 81 million, will be covered by separate payments by each shareholder.

#### Estimated Financial Returns

##### Estimated Earnings

43. A statement of the estimated operational results of the company for the period 1955-66 is presented in Annex A-9. The forecast shows that the company will earn a reasonable annual net profit allowing a dividend of 5% to be paid starting in 1958. The net income from operations, after charging taxes, should cover interest charges about  $1\frac{1}{2}$  times in 1958 and about twice in 1966.

##### Cash Position

44. A forecast of the company's receipts and expenditures for the period 1953-65 is given in Annex A-10 showing that the company should have a satisfactory cash position during the period after meeting all amortization payments. Total debt service will be covered on the average about 1.2 times over the period.

Pro Forma Balance Sheet

45. A pro-forma balance sheet as of the end of 1957 is shown in Annex A-11. Total assets are estimated at F.M. 1,655 million, which includes F.M. 1,641 million for fixed assets after deducting a depreciation reserve of F.M. 54 million. Debt amounting to F.M. 1,229 million will represent 75% of the total capitalization, including reserves.

46. The debt/equity ratio of the company will be relatively high (75/25) on completion of the project, but the position should improve fairly rapidly in the following years.

Conclusions

47. The project will provide a firm supply of electric power at reasonable cost to the Vaasa district, which plays an important part in the Finnish economy. At a later stage it will also provide an addition to the reserve thermal generating capacity in Finland required in years of low water availability. The project is sound and the cost estimates are reasonable. The company has a management capable of the execution and operation of the project.

48. The project is considered suitable for an allocation of \$850,000 of the proposed loan to the Bank of Finland.

PART B

WOODWORKING PROJECTS

General

49. This part of the report is based on data obtained in the field in April and December 1954, and on data submitted by the Central Association of Finnish Woodworking Industries.

50. This report covers five projects, which were selected for possible Bank financing. The aggregate amount of the woodworking part of the loan under consideration is equivalent to \$7.8 million, including a contingency reserve of \$0.45 million.

51. Woodworking is Finland's leading industry and it accounts for about 80% of total exports. The expansion and modernization programs carried out with the aid of funds from previous Bank loans have already been of great help to the industry in increasing output and reducing production costs. Allocations for the woodworking industry out of existing loans are as follows: 1/

Finland - Woodworking Loans

<u>Loan</u>	<u>Date</u>	<u>Allocation</u> <u>(\$ million)</u>	<u>Disbursement (\$ million)</u> <u>(January 25, 1955)</u>
16 FI	August 1, 1949	10.45	Fully disbursed
61 FI	April 30, 1952	9.50	8.37
70 FI	November 13, 1952	<u>3.48</u>	<u>2.06</u>
	Total	<u>23.43</u>	<u>20.88</u>

52. On the whole the management of the woodworking industry is efficient; it keeps abreast of current world developments in the industry, in production, in equipment installation and in maintenance and marketing. The quality of Finland's pulp and paper output compares favorably with similar products in other countries. The plants are run efficiently and unit production rates are satisfactory.

53. Prospects for continued disposal of Finland's growing output, including that arising from new capacity soon to be completed, are good since the outlook is for a steadily increasing demand, particularly in the U.K. and continental Europe. The Finnish woodworking industry does not face any substantial natural handicaps in terms of wood resource availability, technology or location. Changes in Finnish national policy with respect to wages, price stabilization, foreign exchange rates, etc., will, however, continue to affect appreciably the profitability of the woodworking companies.

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1/ Part C includes a summary of the status of major woodworking projects previously financed. Since Loan 21 FI has been fully repaid, it is not discussed.

54. The equipment to be procured through funds from the loan under consideration may be classified as follows:

- (a) Expansion of capacity in existing plants.
- (b) Replacement or modernization of existing facilities, with only minor change in end-product output.

The proposals of the Enso-Gutzeit and Rosenlew firms fall in the first category and the remaining proposals in the latter. Procurement of the equipment has been or will be carried out by international bidding. The cost estimates for the projects for which Bank financing is requested are reasonable.

55. The Bank of Finland has requested that the loan under consideration be made in five currencies in approximately the amounts shown in the following table:

	<u>U.S. \$</u>	<u>Swiss Francs</u>	<u>German Marks</u>	<u>Swedish Kronor</u>	<u>French Francs</u>	<u>Total \$ Equiv.</u>
Enso-Gutzeit	0.94	1.200	0.650	0.520	-	1.48
Kymin Oy	0.86	-	7.147	1.060	42.000	2.89
W. Rosenlew Oy	0.85	0.400	5.922	0.975	-	2.54
A. Ahlstrom Oy	-	-	0.726	-	-	0.17
Aanekoski Oy	-	-	0.325	1.000	-	0.27
Unallocated Reserve for Contingencies	0.45	-	-	-	-	0.45
	<u>3.10</u>	<u>1.600</u>	<u>14.770</u>	<u>3.555</u>	<u>42.000</u>	<u>7.80</u>
Dollar Equivalents	(3.10)	(.37)	(3.52)	(.69)	(.12)	

All figures are in millions

56. The planned program for total capital investment by the above firms for the next few years is shown below.

<u>Firms</u>	<u>Total Investment</u>	<u>Local Currency</u> (Million \$ Equivalent)	<u>Foreign Exchange</u>	
			<u>IBRD</u>	<u>Other</u>
Enso-Gutzeit	13.9	7.4	1.5	5.0
Kymin	7.0	4.0	2.9	0.1
Rosenlew	5.3	2.8	2.5	-
A. Ahlstrom	1.5	0.6	0.2	0.7
Aanekoski	<u>2.3</u>	<u>1.8</u>	<u>0.3</u>	<u>0.2</u>
Total	<u>30.0</u>	<u>16.6</u>	<u>7.4</u>	<u>6.0</u>

57. The foregoing table covers the firm two-year investment programs of the above companies except that of Rosenlew Oy which extends for three years. There are in several cases, additional projects in contemplation which may be undertaken within this period, if suitable arrangements for additional financing can be made. Prompt execution of these additional projects will depend largely on the level of self-financing which will prove feasible within this period.

58. An analysis of the financial position of the companies, to which the proceeds of the proposed loan would be relent, indicates that the first four companies listed are in a strong position with respect to working capital and have a substantial equity in relation to present or immediately prospective debt. The fifth company, Aankoski Oy, while in a relatively less strong position has made satisfactory arrangements to raise the local currency necessary to finance its present expansion program.

59. All the projects reviewed here are physically sound and, if completed, should strengthen the international competitive position of this portion of the Finnish woodworking industry. The position of the companies involved should be improved by reduced production costs and in a few cases by diversification of output.

#### The Projects

##### Enso-Gutzeit Oy

60. Enso-Gutzeit is the largest woodworking enterprise in Finland. The State owns the controlling interest in the company which it acquired after World War I. The remaining shares are held by the Bank of Finland, the National Pensions Fund and private investors. Notwithstanding the public ownership of most of its share capital the company is run as a private enterprise. Total sales in 1953 amounted to 14,376 million FM - equivalent to about \$62 million.

61. This company has received the equivalent of \$7.7 million through previous Bank loans to Finland and now requests an additional amount equivalent to \$1,475,000 for equipment as shown in Appendix B-1.

62. The company operates four main plants and numerous smaller plants manufacturing a wide range of products consisting mainly of rough and finished lumber, boxes, pre-fabricated houses, unbleached kraft pulp, kraft paper, bleached sulphite pulp and paper, building board, corrugated board, and chemical by-products. The project under consideration is mainly for the purpose of increasing the annual capacity of the Kaukopaa sulphate mill from 150,000 to 300,000 tons of kraft pulp. The additional pulp will be used by the company in its other plants to increase the production of liner and corrugated board.

63. The company will be in a position in 1955-56 to self-finance its capital requirements - other than the funds to be made available from the proposed Bank loan. Additional working capital requirements to finance increased output may require some further short-term borrowing, which should not be burdensome.

Kymin Oy - Kymmene AB

64. Kymin Oy, whose shares are widely held, is the second largest pulp and paper company in Finland. Its operations are well integrated. Total sales in 1953 amounted to 10,624 million FM - equivalent to about \$46 million.

65. The company has three main plants and among its products are newsprint, printing and writing papers. From previous Bank loans the company has been allocated the equivalent of about \$2.6 million.

66. The company has requested the equivalent of a further \$2,889,000 for equipment as set forth in Appendix B-1 to be installed at the company's Kymin sulphite and paper mills at Kuusankoski and the Voikka groundwood and paper mills at the same location.

67. Approximately half of the requested loan (\$1,422,000) is intended to finance improvements at the Kymin sulphite pulp mill. A new boiler is to be installed at Kymin, which will increase the production of steam, reduce coal consumption and save about \$365,000 per year.

68. Other projects include additional equipment at the Kymin paper mill and at the Voikka groundwood and newsprint mills. These will increase speeds of the paper machines, resulting in increased output of some 100 tons per day. Part of the additional groundwood requirements will be met by replacing old grinders with new units of greater capacity.

69. This company's cash requirements for its planned investments, aside from the funds requested from the proposed Bank loan, will be covered by prospective retained earnings and a small long-term internal loan already arranged. If necessary, the company could arrange to borrow substantial sums to execute additional projects without endangering its present sound financial position.

W. Rosenlew and Co. AB

70. This company is a long-established concern controlled by the Rosenlew family with some participation from the staff pension fund. Its woodworking operations include saw-mills and the production of both sulphite and sulphate pulp, kraft paper and bags, box-boards and prefabricated houses. The company also has substantial other interests, including engineering works and brick and yeast plants. Sales of woodworking products in 1953 accounted for almost two-thirds of total sales of 6.247 million FM - equivalent to about \$27 million.

71. The company has applied for funds totalling \$2,539,000 for items as shown in Appendix B-1, to raise production from 34,000 to 50,000 tons per year in the kraft paper mill, and from 38,000 to 55,000 tons per year in the sulphate mill.

72. About half of the requested loan funds would be used in the kraft paper mill. Three of the old paper machines will be rebuilt and the fourth will be replaced with a new high-speed kraft paper machine, with a productive capacity of 16,000-20,000 tons per year.

73. The remainder would be used to increase capacity of various sections of the sulphate mill, and to install a black liquor recovery unit. This will enable the company to recover the chemicals, and, as a by-product of this process, provide an additional quantity of steam.

74. The increased supply of sulphate pulp will be used for the additional output of kraft paper which is destined for export, almost entirely to Western Europe. In recent years about 60% of the kraft paper output was exported.

75. The company's prospective financial position for the next three years should enable it to cover its capital requirements (apart from the amount requested under the proposed Bank loan) and most, if not all, of the increased working capital requirements. It is in a favorable position to incur further debt for working capital purposes, in the unlikely event of this proving necessary.

#### A. Ahlstrom Oy

76. This company is one of the oldest and biggest private industrial enterprises in Finland. The company produces groundwood pulp, unbleached sulphite, newsprint, sawn goods, building board, pre-fabricated houses, plywood, and also has extensive interests in engineering works and glassworks. Total sales in the 18 month period ended June 30, 1954, totalled 17,577 million FM (about \$76 million equivalent). Woodworking products sales accounted for almost 2/3 of total sales.

77. The company has requested \$173,000 under the proposed loan for items listed in Appendix B-1 as part of the cost of their investment program. The project consists of replacing two old and inefficient grinders with two modern 3,000 H.P. continuous units. This will enable the company to save about \$48,000 per year in total power costs. Motors to complement these grinders are to be imported from Germany, with funds obtained from other sources.

78. The company's present firm investment program is very small and the company would have no difficulty in self-financing additional small projects which are under consideration. The company also has under consideration a major expansion involving the equivalent of several millions of dollars after 1957 but this is largely dependent on its ability to self-generate sufficient funds. It has large overdraft facilities, now unused.

Aankoski Oy

79. This firm has a 50-year history in the woodworking business. Two years ago, the controlling interest (98%) was sold to Metsaliiton Selluloosa Oy, a company controlled by the cooperative association of forest owners. This acquisition was partly financed by a loan to the controlling company by Aankoski Oy.

80. The company operates plants producing newsprint and printing paper, unbleached sulphite and groundwood pulp, boards, sawn lumber and by-product chemicals. In addition it operates its own small power stations, both hydro and thermal. Its total sales in 1953 totalled 1,532 million FM - equivalent to about \$7 million.

81. The company's firm investment program amounts to \$2.3 million equivalent, involving \$430,000 in foreign exchange. It is requesting \$270,000 under the proposed Bank loan for items listed in Appendix B-1. The project consists of building a five stage evaporation plant for the sulphite plant waste liquor and a generator for the Hilmo water power plant capable of producing 27 million kwh per year.

82. The annual savings in terms of coal, as a result of the installation of the evaporation plant and other improvements, will be about 14,000 tons for fuel and power and about 2,000 tons for steam. This saving will be the equivalent of approximately \$300,000 per year.

83. The total cost of the hydro power plant at Hilmo will be in the neighborhood of \$1.5 million. The maximum capacity of this plant will be 6,000 kw. This energy will be transmitted some 60 km to be used in the company's mills, thereby reducing annual coal consumption by about 12,000 tons, which will mean a saving of approximately \$220,000 a year. Several months ago it was estimated that the construction works could be completed by the end of 1956, but more time may be required.

84. Arrangements have been made to ensure that the company will be able to raise the necessary local currency to finance its investment program and to meet nearby maturities of its debts.

Conclusions

85. The proposed projects should reduce unit production costs, in several cases raise output and improve the competitive position of the companies concerned in markets at home and abroad.

86. The woodworking projects described above are considered suitable for an allocation of \$7.8 million. This amount includes a contingency reserve of \$450,000 which may be used to finance additional items of equipment not shown in the list of goods (Annex B-1) or to compensate for price increases.

PART C

STATUS OF PROJECTS PREVIOUSLY FINANCED

Power Programs

1949 Loan

87. Of the loan made on August 1, 1949, a total of \$2 million was allocated to cover the cost of various equipment and materials to be imported in connection with a power expansion program carried out in Finland over the period 1946-52. This amount was later reduced to \$1.75 million, which was distributed over a number of projects and allocated to the following companies:

<u>Company</u>	<u>Project</u>	<u>Allocation</u>
United Paper Mills	Walkeakoski Hydro Plant	\$ 100,000
Imatran Voima Oy	Imatran Hydro Plant and Petajavesi Substation	646,048
Oulujoki Oy	Construction Equipment	748,929
Various Companies		255,023
	Total	<u>\$ 1,750,000</u>

88. All equipment had been imported and put into operation by the end of 1952.

1952 Loan

89. Of the loan made on April 30, 1952, a total of \$9.5 million was allocated to cover part of the foreign exchange cost of the third stage of a program to increase the supply of electrical power in Finland. The program was initiated in 1946 and was necessary first of all to replace generating capacity lost by the Peace Treaty and later to cover the steadily increasing domestic and industrial demand for power. In the third stage of this program is included the construction of three hydro-electric power plants in Northern Finland (Montta, Utanen and Petajaskoski), one in Southeast Finland (Pamilo) and one thermo electric power plant in West Finland (Vaasa). These plants, which will have a total generating

## SUOMEN PANKKI --- FINLANDS BANK

International Bank for Reconstruction and Development  
1818 H Street, N. W.  
Washington 25, D. C.

Gentlemen:

With reference to the proposed Loan Agreement (Power and Woodworking Projects) to be executed between us, we are pleased to give you below the additional information you have asked us for.

1. Terms of relending

It is our intention to relend to the companies which are to carry out the projects described in the proposed Loan Agreement the amounts in foreign exchange equivalent to the cost of the goods to be purchased by them for use in the projects on the same terms and conditions as to interest and other charges, maturity and redemption premium as will be contained in your proposed Loan Agreement with us. In addition, an annual commission of 1/10 of 1% will be charged to cover the expenses of Suomen Pankki--Finlands Bank. Repayments by the companies will be in the foreign currency required or the equivalent in Finnish marks at the then current rate of exchange. We may agree to entire or partial repayments in foreign currency before maturity.

2. Sources of financing supplementary to the International Bank's loan

The companies carrying out the projects will finance them partly out of the proceeds of the loan from the International Bank, partly out of their own resources or borrowed funds, or both. All these companies are in a good financial position so that they should be able to obtain credit from regular financial institutions in Finland, such as the National Pensions Fund, Industrial Mortgage Bank, Postal Savings Bank and the commercial banks.

Since, under Section 5.01 of the proposed Loan Agreement we will be obliged to cause the projects to be carried out with due diligence and efficiency, we are pleased also to give you the undertaking that you have asked for, namely: If, at any time, it seems likely that any of the companies which are to carry out the projects described in the proposed Loan Agreement will not have sufficient funds to meet the cost of those projects, we will promptly make arrangements satisfactory to the Bank to ensure that they are provided.

Please notify us of your agreement with the foregoing by signing the form of confirmation on the enclosed copy of this letter and returning the copy to us.

SUOMEN PANKKI--FINLANDS BANK

Confirmed:

INTERNATIONAL BANK FOR RECONSTRUCTION  
AND DEVELOPMENT

capacity of 277,000 kw, will be constructed during the period 1952-57. The program also includes the construction of a number of transmission lines and substations connecting the new plants to the national grid and new lines connecting the power plants in North Finland with the major load centers in South Finland.

90. The proceeds from the Bank loan were allocated to three major categories. As shown below, the allocations were subsequently revised:

<u>Category</u>	<u>Original Allocation</u>	<u>Revised Allocation</u>
	US\$	US\$
A. Power Plant Equipment	1,716,000	1,361,000
B. Construction Equipment	3,820,000	3,820,000
C. Transmission Line Materials and Substation Equipment	<u>3,964,000</u>	<u>4,319,000</u>
Total	9,500,000	9,500,000

91. The allocations of the loan to the different projects and the present estimated construction costs are given in the following table:

<u>Project</u>	<u>IBRD Loan</u> (1000 \$)	<u>Estimated Total Cost</u> (1000 \$)
Montta Plant	696	20,992
Utanen Plant	506	16,251
Petajaskoski Plant	2,012	33,000
Pamilo Plant	1,430	12,304
Vaasa Plant with Transmission system	610	6,820
Transmission Lines	<u>4,246</u>	<u>22,545</u>
Total	9,500	111,912

Descriptions and Progress of the Projects

92. The progress on the projects has in general been satisfactory. In some cases it has been necessary to extend the original construction schedules because of difficulties of a technical nature which required redesigning of structures. Unfavorable weather conditions particularly during the summer of 1954 also delayed the construction work to some extent.

Montta Hydroelectric Power Plant

93. The project consists of the construction of a power plant at the Montta Rapids of the Oulu River. Three generating units having a total capacity of 45,000 kw will be installed in the plant. The work on the project, which is carried out by Oulujoki Oy, was started in the beginning of 1952. Difficult conditions were encountered in the construction of the foundations for the dam structure which delayed the progress of the work 2-3 months. These difficulties have now been overcome and the construction of the dam and the powerhouse was largely completed at the end of 1954. The installation of the first generating unit is expected to be completed in October 1955 to be followed at three months intervals by the second and third units.

Utanen Hydroelectric Power Plant

94. The project consists of the construction of a power plant at the Utanen Rapids on the Oulu River. Three generating units having a total capacity of 52,500 kw will be installed in the plant. The work on the project, which is carried out by Oulujoki Oy, was started in the beginning of 1953 and has been progressing satisfactorily. The civil works are well under way and are expected to be largely completed by the end of 1955. The installation of the generating units will be started in the beginning of 1956 and the first unit is expected to be put in operation in December 1956, to be followed by the second and third units at three months intervals. Further excavation work in the 11 kilometer long tailrace channel will be carried out after the plant has been put in operation and final completion of the project is scheduled for October 1958.

Petajaskoski Hydroelectric Power Plant

95. The project consists of the construction of a power plant at the Petajaskoski Rapids on the Kemi River. The status of this project has been given in paragraphs 10-14 above.

Pamilo Hydroelectric Power Plant

96. The project consists of the construction of a power plant on the Koitere River. Two generating units having a total capacity of 50,000 kw will be installed in the plant. The work on the project, which is carried out by Enso Gutzzeit Oy, was started in the summer of 1952 and has been progressing satisfactorily. By the end of 1954 most of the civil works including the construction of canals and a number of small earth and concrete dams and the excavation of the underground powerhouse were completed and the installation of equipment under way. The first unit is expected to be put in operation in April 1955 to be followed by the second unit one month later.

Vaasa Thermal Electric Power Plant

97. The project consists of the construction of a thermal plant at Vaasa and a connecting transmission line network. The status of this project is given in paragraphs 29-35 above.

Transmission Lines

98. The project consists of the construction of a number of transmission lines and substations to connect the new plants to the national grid and increase the capacity of this grid. The work is carried out by Imatran Voima Oy. Since the loan was made the plans have been revised and the Bank has agreed to a number of changes. The major one was to increase the voltage of the Petajaskoski - Alajarvi line from 220 kv to 380 kv. The following lines are now included in the project:

<u>Line</u>	<u>Voltage</u> kv	<u>Capacity</u> kv	<u>Length</u> km
1. Nuojua - Tammisto	220	150,000	500
2. Viinijarvi - Pamilo	110	50,000	66
3. Petajaskoski - Alajarvi	380	450,000	381
4. Puhakoski - Pikkarala	220	150,000	17
5. Alajarvi - Petajavesi	220	150,000	100

Line No. 1 was completed in June 1954. Work on Line No. 2 was far advanced at the end of 1954 and expected to be completed in January 1955. Construction of the remaining three lines was started in the summer of 1954. Lines No. 3 and 5 are scheduled to be completed by the end of 1955 and Line No. 4 in the middle of 1956.

Woodworking Industries

Allocations Under the Three Loans

99. Under the three presently outstanding Bank loans, the Finnish woodworking industries have received a total allocation equivalent to \$23.43 million.

100. The allocation under the first loan, \$10.45 million, <sup>all</sup> of which had been disbursed by December 1953, was for eight major projects and six smaller projects. The two 1952 loans originally provided for financing part of the foreign exchange cost of the modernization and expansion projects of fifteen, subsequently reduced to fourteen, woodworking companies. As noted below, these projects have since been modified and the revised allocation to woodworking projects under the 1952 loans totals \$12.98 million equivalent.

1949 Loan

101. The table below gives the principal beneficiaries, the type of project, the amount of IBRD financing and dates of completion of the projects:

	<u>Type of Project</u>	<u>Amount Disbursed</u>	<u>Date of Completion</u>
<u>United Paper Mills</u>			
Sulphate Mill	Soda recovery unit	\$ 700,000	9/30/53
<u>Kymin Oy</u>			
Cellulose Mill	Pyrite burner plant )	2,556,619	10/10/53
Power Plant	Steam generator )		10/4/53
<u>Kemi Oy</u>			
Sulphate Mill	Modernization	450,000	9/10/52
<u>Enso-Gutzeit Oy</u>			
Sulphate Mill	Kraft paper machine)	3,601,122	12/14/50
Paper Mill	Paper machine )		1/25/53
<u>Serlachius Oy</u>			
Paper Mill	Grease-proof paper machine	2,174,158	5/27/52
<u>Rauma-Raaha Oy</u>			
Sulphite Mill	Change to sulphite soda	422,283	7/10/53
<u>Seven Small Projects</u>	Miscellaneous equipment	<u>545,818</u>	during 1952
		<u>\$ 10,450,000</u>	

1952 Loans

102. The following table shows the original and revised loan allocations under the two loans:

<u>Project</u>	<u>Item</u>	<u>Original</u>	<u>Revised</u>	<u>Estimated Total Cost Of Project</u>
		---(Thousand \$)---		
<u>Tampella Oy</u> Pulp & Paper Board Plant	Board machine and auxiliary equipment	1,956	---Cancelled---	
<u>Enso-Gutzeit Oy</u> Paper Mill	Kraft paper machine	835	1,470	4,523
Newsprint Mill	Newsprint machine	1,315	2,619	14,416
<u>Veitsiluoto Oy</u> Semi-chemical Pulp Mill	Equipment	1,086	-- Cancelled --	
Paper Mill	Parts of paper machine and power equipment		806	7,082
<u>Kemi Oy</u> Sulphate Pulp Mill	Soda recovery boiler, power and miscellaneous	1,058	1,156	3,997
<u>Joutseno Oy</u> Sulphate Pulp Mill	Miscellaneous and power equipment	1,274	1,274	12,600
<u>Myllykoski Oy</u> Board Mill	Paperboard machine	950	-- Cancelled --	
Paper Mill	Modernization of two paper machines		380	4,610
Hydro-Power Station	Water turbines		547	5,650
<u>United Paper Mills</u> Newsprint Mill	Paper machine	1,300	2,361	22,120
<u>Oulu Oy</u> Sulphate Pulp Mill	Soda recovery boiler, miscellaneous and power equipment	1,661	890	3,410
Various Projects (7)	Miscellaneous equipment	1,540	1,472	7,926
		<u>12,975</u>	<u>12,975</u>	<u>86,334</u>

103. The most important change in the program was the cancellation of the Tampella project for the production of semi-chemical pulp and its use for paper board production. This project was abandoned because the company considered the market outlook unfavorable for its product and also because of certain technical difficulties. Other major changes included cancellation of the Veitsiluoto project for the expansion of an existing semi-chemical pulp mill and a modification of the Oulu project for an increase of the capacity of its sulphate mill. The loan funds released by these and other changes were applied to the financing of imports of additional items of plant and equipment subsequently approved by the Bank.

#### Progress of Projects

104. All the woodworking projects financed from the first loan were completed and are in operation. Progress on the projects financed from the second and third loans is encouraging, although in some instances construction schedules had to be extended by 3-10 months mainly because of changes in original plans and designs. Of the fourteen projects financed from the two loans, nine were completed by the end of 1954 or will be completed early in 1955. Most of the other projects are expected to be completed by the middle of 1955 and a few in the second half of the year.

105. The following is a brief description of the present status of the major projects financed from the second and third loan:

(i) Enso-Gutzeit Oy

Kotka Kraft Paper Mill

This project has been completed and has been in operation since March 1954. It involved the increase in production capacity of kraft paper by 45,000 tons to a total of 90,000 tons per year through the installation of a second paper machine.

Summa Newsprint Mill

The project provides for the erection of an integrated pulp and paper plant of 90,000 tons per year capacity. Construction of buildings of the ground and paper mill have advanced satisfactorily and installation of the equipment is under way. The project initially has been somewhat delayed due to a change in plans for its location. Its completion is now scheduled for August 1955.

(ii) Veitsiluoto Oy

The project as revised is for the construction of a paper mill, containing a paper machine of an annual capacity of 30,000 tons and for an expansion of related boiler and generating capacity. Construction of the project has been largely completed and trial operations started late in 1954.

(iii) Kemi Oy

The company's modernization program provides for an increase in annual capacity of an existing sulphate pulp mill by 20,000 tons and an increase in efficiency and reduction in cost of over-all operations. The major project of the program, i.e., the soda-recovery unit was installed in June 1954 and has been in continuous operation since. Most of the improvements in other departments have been completed and the remaining reconstruction work is expected to be finished in the second quarter of 1955.

(iv) Joutseno Oy

A new mill of an annual capacity of 42,000 tons of sulphate pulp is being constructed to increase total annual capacity of an existing plant to 60,000 tons. The project includes construction of a power plant and soda recovery unit and the installation of a steam turbo-generator and auxiliary equipment. This project was initially retarded because of changes in design and delays in placing orders and in obtaining deliveries of the equipment. Construction progress has been satisfactory and the plant can be expected to be in partial operation in the middle of 1955 and fully completed by the end of the year.

(v) Myllykoski Oy

The company's modernization program as revised in September 1953 provides for an increase by 20,000 tons in the annual capacity of an existing paper mill by the reconstruction of two paper machines. Because of alterations of the original plans, the reconstruction work did not start before the beginning of 1955. The project may be expected to be ready for operation by the middle of 1955. In February 1955 the Bank agreed to allocate \$547,000 for part of the cost of turbines for the Vuolenkoski hydro plant which would furnish an estimated 58 million kwh at mean water flow.

(vi) United Paper Mills

The project covers the first stage of construction of a newsprint mill including a paper machine of 70,000 tons annual capacity and supplementary facilities for the production of mechanical pulp and the generation of steam, to supply additional ground wood, steam and power needed. All building construction and principal installations of this project have been completed and the No. 1 paper machine was put into continuous operation in September 1954. Orders have been placed for a second paper machine of 50,000 tons per year capacity, to be delivered and erected by October 1955.

(vii) Oulu Oy

The company's revised expansion program provides for an increase in the capacity of an existing sulphate pulp mill from 90,000 tons to 125,000 tons per year. The larger part of the new installations has been completed and put into operation including the chemical recovery boiler, the water treatment plant and most of the new digesters. The remaining installations are expected to be completed early in 1955.

(viii) Various Projects

About \$1.5 million of loan funds have been allocated for imports of equipment required for the modernization and expansion programs of seven companies as follows:

Kajaani Oy - sulphite mill  
Kymn Oy - industrial power plant  
Metsanomistajain Oy - sawmill  
Pietarsaaren Oy - sulphite mill  
Serlachius Oy - paper board plant  
Topilla Oy - mechanical pulp mill  
Saastamoinen Oy - sawmill

The loan allocations, the larger part of which has already been utilized, cover part or all of the cost of a number of miscellaneous items, including an evaporation plant, circulation system and a drying machine for sulphite pulp production, two steam turbines and turbo-generator, as well as miscellaneous handling equipment, workshop tools and dredging and clearing equipment.

Financial Aspects

106. Some of the companies were faced with financing difficulties. As a result, original investment programs were modified, resulting in project cancellations or delays in construction of a few projects already begun. Kemi Oy was reorganized, enabling it to raise new capital.

107. Those companies which would be the recipients of the proposed loan are in sound financial condition. As far as can presently be foreseen, they should be able to find the funds (additional to those to be made available by the Bank) necessary for the completion of their investment programs.

Production Aspects

108. The completed plants partly financed by the 1949 loan have already made a substantial contribution to Finnish pulp and paper output and sales. The paper plants thus financed accounted for 110,000 tons of kraft paper and liner board (Enso-Gutzeit) and 9,000 tons of grease-proof paper (Serlachius) in 1953, and probably even more in 1954. In addition, modernization of pulp mills, installation of soda-recovery, pyrite burning and steam-generating facilities at four other companies have reduced unit production costs and contributed to import savings on fuels and chemicals.

109. When the projects partly financed by the 1952 loans come into operation, it is expected that Finland's annual production capacity of sulphate pulp will increase by an additional 97,000 tons or about 16%, of newsprint by 220,000 tons or about 50% and of all other paper products by 75,000 tons or about 25%. In addition the installation of a number of soda-recovery boilers will result in considerable savings in fuel imports and an increase in steam-generating capacity.

PETAJASKOSKI PROJECT

Construction Cost Estimate

	<u>Foreign Cost</u> <u>Million US \$ equiv.</u>	<u>Local Cost</u> <u>Million F.M.</u>	<u>Total</u> <u>Million F.M.</u>
Civil works	2.6	2,215	2,815
Mechanical and electrical equipment	3.42	685	1,475
Permanent buildings, construc- tion camp, roads and water rights	.16	1,375	1,413
Overhead, taxes, interest during construction	.02	1,916	1,920
Total	6.20	6,191	7,623
Total (in million US \$ equivalent)	6.20	26.8	33.0

FETAJASKOSKI PROJECTEquipment to be Financed by Bank Loan

<u>Equipment</u>	<u>Cost</u>	<u>Cost US \$ equivalent</u>
Two Kaplan turbines 66,000 HP	Swiss Fr. 3.5 million	.81 million
Two generators 55 mva, 12 kv, 3-phase (with accessories)	D. Mk. 4.65 million	1.11 million
Four transformers 40/60/100 mva, 12/234/400 kv. 1-phase and 55 mva Reactor	Sw. Kr. 3.65 million	.71 million
Switching equipment and metering devices	Swiss Fr. 1.80 million	.42 million
Series condenser 45 mva	Sw. Kr. 1.55 million	.30 million
	<hr/>	
Totals	Swiss Fr. 5.30 million	\$3.35 million
	D. Mk. 4.65 "	
	Sw. Kr. 5.20 "	

## ANNEX A-3

## KEMIJOKI OY

## Forecast of Operating Results

(in millions of Finnish Markkas)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
1. Revenues from Power Sales	751	828	828	828	828	828	828	846	864	864	864	864	864	864	864
2. Other Income <u>a/</u>	15	15	14	14	14	13	13	12	12	12	11	11	10	10	9
3. Gross Income	766	843	842	842	842	841	841	858	876	876	875	875	874	874	873
4. Operating Expenses <u>b/</u>	49	55	56	58	62	62	68	78	83	83	83	83	85	85	86
5. Provision for Depreciation <u>c/</u>	186	260	271	283	283	250	188	188	188	188	188	188	188	188	188
6. Provision for Taxes <u>d/</u>	8	14	20	24	30	35	53	86	101	119	123	133	142	151	161
7. Total Operating Expenses and Provisions	243	329	347	365	375	347	309	352	372	390	394	404	415	424	435
8. Net Income from Operations	523	514	495	477	467	494	532	506	504	486	481	471	459	450	438
less: Interest Charges <u>e/</u>	523	514	495	472	448	429	410	385	369	351	329	310	289	268	245
9. Net Income	-	-	-	5	19	65	122	121	135	135	152	161	170	182	193
10. Dividends <u>f/</u>				-	-	-	-	40	40	40	60	60	60	60	60
11. Accruals to Surplus				5	19	65	122	81	95	95	92	101	110	122	133
12. Net Generation (million KWH)	420	460	460	460	460	460	460	470	480	480	480	480	480	480	480
13. Rate FM/KWH	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80

a/ Payments by Imatran Voima Oy to cover interest and amortization charges on the part of the IBRD loan which will be used to finance the cost of equipment for the Pikkarala substation.

b/ The estimate of the operating expenses are based on experience from operation of similar plants in Finland. It includes overhead expenses, salaries and wages, repair and maintenance costs, welfare, insurance and miscellaneous costs.

c/ The figures represent the depreciation allowance amounting to 2.5% on the cost of buildings and structures, 3.33% on the cost of equipment, and 20% on the cost of temporary structures, roads and similar works.

d/ Includes provision for property and income taxes at present rates.

e/ Interest rates are estimated at 4-3/4% for the IBRD loans and at 8% for the domestic loans.

f/ It is estimated that a dividend of 5% on the share capital can be paid from 1964 and increased to 7.5% in 1967.

## ANNEX A-4

## KEMIJOKI OY

## Forecast of Receipts and Expenditures

(in millions of Finnish Markkas)

Receipts	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
1. Net Income from Operations					523	514	495	477	467	494	532	506	504	486	481	471	459	450	438
2. Provision for Depreciation					186	260	271	283	283	250	188	188	188	188	188	188	188	188	188
3. Receipts from Operations					709	774	766	760	750	744	720	694	692	674	669	659	647	638	626
4. Proceeds Sale of Capital Stock <u>a/</u>		189	500																
5. Allocation IBRD Loans																			
(i) Loan No. 61 FI	236	152	77																
(ii) Proposed Loan			355	409															
6. Domestic Loans																			
(i) Government Unemployment Fund	611	540																	
(ii) National Pension Fund		460	1,200	1,500	500														
(iii) Postal Savings Bank		300	230	365	143														
(iv) Commercial Banks		50		100															
(v) Imatran Voima Oy	128	174																	
7. Total Receipts	1,025	1,815	2,362	2,374	1,352	774	766	760	750	744	720	694	692	674	669	659	647	638	626
<b>Expenditures</b>																			
8. Capital Expenditures <u>b/</u>																			
(i) Local Currency Cost	770	1,510	1,867	1,880	630														
(ii) Foreign Exchange Cost	255	305	495	494	13														
9. Total	1,025	1,815	2,362	2,374	643														
10. Debt Service IBRD Loans (interest and amortization) <u>c/</u>					140	136	132	129	125	121	117	113	109	106	101	98	93	90	85
11. Debt Service Domestic Loans (interest and amortization)					569	638	634	631	625	623	603	541	543	528	508	501	494	488	481
12. Dividends												40	40	40	60	60	60	60	60
13. Total Expenditures	1,025	1,815	2,362	2,374	1,352	774	766	760	750	744	720	694	692	674	669	659	647	638	626

a/ The total subscribed share capital is F.M. 800 million. However, only F.M. 689 million is available for investment in the project; the balance of F.M. 111 million represent the value of water rights transferred to the company.

b/ The figures include the rest value of construction equipment, temporary buildings and materials estimated at F.M. 460 million. Also included is the cost of substation equipment to be installed by Imatran Voima Oy, as well as interest payments on borrowed funds during the construction period.

c/ The estimated debt service of the IBRD loans is based on a separate agreement between the company and the Bank of Finland providing for equal annual amortization payments with the first payment in 1957.

## ANNEX A-4

## KEMIJOKI OY

## Forecast of Receipts and Expenditures

(in millions of Finnish Markkas)

Receipts	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
1. Net Income from Operations					523	514	495	477	467	494	532	506	504	486	481	471	459	450	438
2. Provision for Depreciation					186	260	271	283	283	250	188	188	188	188	188	188	188	188	188
3. Receipts from Operations					709	774	766	760	750	744	720	694	692	674	669	659	647	638	626
4. Proceeds Sale of Capital Stock <u>a/</u>		189	500																
5. Allocation IBRD Loans																			
(i) Loan No. 61 FI	236	152	77																
(ii) Proposed Loan			355	409															
6. Domestic Loans																			
(i) Government Unemployment Fund	611	540																	
(ii) National Pension Fund		460	1,200	1,500	500														
(iii) Postal Savings Bank		300	230	365	143														
(iv) Commercial Banks		50		100															
(v) Imatran Voima Oy	128	174																	
7. Total Receipts	1,025	1,815	2,362	2,374	1,352	774	766	760	750	744	720	694	692	674	669	659	647	638	626
<b>Expenditures</b>																			
8. Capital Expenditures <u>b/</u>																			
(i) Local Currency Cost	770	1,510	1,867	1,880	630														
(ii) Foreign Exchange Cost	255	305	495	494	13														
9. Total	1,025	1,815	2,362	2,374	643														
10. Debt Service IBRD Loans (interest and amortization) <u>c/</u>					140	136	132	129	125	121	117	113	109	106	101	98	93	90	85
11. Debt Service Domestic Loans (interest and amortization)					569	638	634	631	625	623	603	541	543	528	508	501	494	488	481
12. Dividends												40	40	40	60	60	60	60	60
13. Total Expenditures	1,025	1,815	2,362	2,374	1,352	774	766	760	750	744	720	694	692	674	669	659	647	638	626

a/ The total subscribed share capital is F.M. 800 million. However, only F.M. 689 million is available for investment in the project; the balance of F.M. 111 million represent the value of water rights transferred to the company.

b/ The figures include the rest value of construction equipment, temporary buildings and materials estimated at F.M. 460 million. Also included is the cost of substation equipment to be installed by Imatran Voima Oy, as well as interest payments on borrowed funds during the construction period.

c/ The estimated debt service of the IBRD loans is based on a separate agreement between the company and the Bank of Finland providing for equal annual amortization payments with the first payment in 1957.

KEMIJOKI OY

Pro Forma Balance Sheet  
as of December 31, 1957

(in millions of Finnish Markkas)

Assets

Fixed Assets	8,219	
less Depreciation	<u>186</u>	
Net Book Value		8,033
Water Rights		<u>111</u>
		<u>8,144</u>

Liabilities

Capital Stock		800
Loans:		
Allocation IBRD Loans	1,229	
less Amortization	<u>82</u>	
		1,147
Domestic Loans	6,301	
less Amortization	<u>104</u>	
		<u>6,197</u>
		<u>7,344</u>
		<u>8,144</u>

ETELA-POHJANMAAN VOIMA OY  
Vaskiluoto Steam Power Station

Construction Cost Estimate

	<u>Foreign Cost</u> <u>US\$ equivalent</u>	<u>Local Cost</u> <u>Million F.M.</u>	<u>Total Cost</u> <u>Million F.M.</u>
Equipment			
Boiler Plant	260,000	235	345
Turbo generator Plant	745,000	40	212
Fuel Handling		43	43
Electrical	151,000	21	56
Building Construction	108,000	207	232
Duty and Sales Tax		195	195
Engineering, Interest during Construction, General Expenses		164	164
Total	1,264,000	955	1,247
Total (in US \$ equivalent)	1,264,000	4.136	5.400

ETEIA-POHJANMAAN VOIMA OYVaskiluoto Steam Power PlantEquipment to be Financed with Proposed Bank Loan

<u>Equipment</u>	<u>Cost</u>	<u>Cost US \$ equivalent</u>
Turbo generator	D. Mk. 2,750,000	655,000 <sup>1/</sup>
Feed Pumps, Pipes, Valves	D. Mk. 800,000	190,000
Fuel Oil and Ash-Handling Equipment	E 18,000	50,000
Regulators and Control Equipment	D. Kr. 450,000	65,000
Switching Equipment	Sw. Fr. 200,000	47,000
Transformer	D. Mk. 300,000	71,000
Contingencies	D. Mk. 115,000	27,000
	<hr/>	
Total	D. Mk. 3,965,000 Sw. Fr. 200,000 D. Kr. 450,000 E 18,000	1,105,000 <sup>1/</sup>

<sup>1/</sup> Includes \$255,000 to be financed under Loan No. 61-FI.

ETELA-POHJANMAAN VOIMA OYPower RatesEstimated Rates to be Charged by the Company

	<u>Annual KW Charge F.M.</u>	<u>KWH Rate F.M.</u>	<u>Estimated Load 1,000 KW</u>	<u>Estimated Annual Power Sales million KWH</u>	<u>Estimated Average KWH Rate (F.M.)</u>
1956	7,000	1.78	30.6	92.5	3.94
1957	7,000	1.78	33.7	102.0	3.94
1958	8,500	2.00	37.0	112.0	4.85
1959	8,500	2.00	40.7	123.0	4.85
1960	8,000	2.00	45.0	135.0	4.25
1961	7,200	2.00	49.5	148.0	4.25
1962	7,200	2.00	54.5	162.0	4.25
1963	7,200	2.00	60.0	178.0	4.25
1964	7,200	2.00	66.0	195.0	4.25
1965	7,200	2.00	73.0	214.0	4.25

Rates to be Paid by the Company for Purchase of Power from:

	<u>Annual KW Charge F.M.</u>	<u>KWH Rate F.M.</u>
Pohjolan Voima Oy Hydro Power	8,550	1.80
Imatran Voima Oy Hydro Power	8,050	1.70
Vaasa Municipal Power Co. Thermal Power	5,380	0.70

## ANNEX A-9

## ETELA-POHJANMAAN VOIMA OY

## Forecast of Operational Results

(in millions of Finnish Markkas)

	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
1. Revenues from Power Sales <u>a/</u>		395	442	570	632	630	641	714	795	849	936	1,029
2. Other Receipts <u>b/</u>	81	81	81	81	81	81	81	81	81	81	81	81
3. Gross Receipts	81	476	523	651	713	711	722	795	876	930	1,017	1,110
4. Less: Purchase of Hydro Power		384	420	324	324	228	228	295	374	423	504	590
5. Net Receipts	81	92	103	327	389	483	494	500	502	507	513	520
6. Operating Expenses <u>c/</u>	17	17	17	107	170	266	276	294	306	315	327	350
7. Provision for Depreciation <u>d/</u>	18	18	18	73	73	73	73	73	73	73	73	73
8. Provision for Taxes <u>e/</u>	2	2	2	6	9	10	10	10	11	11	12	12
9. Total Operating Expenses and Provisions	37	37	37	186	252	349	359	357	370	399	412	435
10. Net Income from Operations	44	55	66	141	137	134	135	123	112	108	101	85
11. Less: Interest Charges <u>f/</u>		20	19	95	88	81	75	69	62	56	50	44
12. Net Profit	44	35	47	46	49	53	60	54	50	52	51	41
13. Dividends <u>g/</u>				15	15	15	15	15	15	15	15	15
14. Accruals to Surplus	44	35	47	31	34	38	45	39	35	37	36	26

a/ Possible sales of steam power to the National Grid which will result in additional revenues after 1960 has not been taken into account.

b/ Figures represent annual cash payments by shareholders to cover total operating expenses of transmission line system.

c/ Figures include fuel cost, maintenance, wages and salaries, overhead, welfare, insurance and miscellaneous expenses.

d/ Figures represent ~~maximum~~ legal depreciation allowance amounting to 2.5% on the initial cost of buildings and structures and 5% on the initial cost of equipment.

e/ Figures are based on present rates of municipal and state property and income taxes.

f/ Figures are based on interest rates of 4-3/4% on the IBRD loans and 8% on the domestic loans.

g/ A dividend rate of 5% on the share capital has been assumed.

ETELA-POHJANMAAN VOIMA OYForecast of Receipts and Expenditures

(in millions of Finnish Markkas)

<u>Receipts</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>
1. Net Income from Operations			44	55	66	141	137	134	135	123	112	108	101
2. Provision for Depreciation			18	18	18	73	73	73	73	73	73	73	73
3. Receipts from Operations			62	73	84	214	210	207	208	196	185	181	174
4. Proceeds Sale of Capital Stock	60	60	90	90									
5. Allocation IBRD Loans													
(i) Loan No. 61 FI	53	20	68										
(ii) Proposed Loan			26	85	85								
6. Domestic Loans													
(i) National Pension Fund			100	100	100								
(ii) Postal Savings Bank			60	60	60								
(iii) Commercial Banks	100	100		55	55								
(iv) Loans from Shareholders			38	100									
7. Total Receipts	213	180	444	563	384								
<u>Expenditures</u>													
8. Capital Expenditures <u>a/</u>													
(i) Local Currency Cost	149	100	371	418	283								
(ii) Foreign Exchange Cost	53	20	94	120	87								
9. Total	202	120	465	538	370								
10. Debt Service IBRD Loans <u>b/</u> (interest and amortization)				9	9	38	37	36	35	34	33	32	30
11. Debt Service Domestic Loans (interest and amortization)				29	28	146	141	135	130	125	119	114	109
12. Dividends						15	15	15	15	15	15	15	15
13. Total Expenditures	202	120	465	576	407	199	193	186	180	174	167	161	154
14. Annual Cash Accruals or Deficits (-)	11	60	(-)21	(-)13	(-)23	15	17	21	28	22	18	20	20
15. Cash Accruals - Cumulative	11	71	50	37	14	29	46	67	95	117	135	155	175

a/ Figures include total estimated construction of transmission line system and thermal plant including interest during construction and in addition an amount of F.M. 43 million representing estimated cost of employees' dwelling units.

b/ The amortization of the allocation of the IBRD loan is calculated on the basis of equal annual payments according to agreement between the company and the Bank of Finland.

ETEIA-POHJANMAAN VOIMA OYPro Forma Balance Sheet  
as of December 31, 1957

(in millions of Finnish Markkas)

Assets

Fixed Assets	1,695	
less Depreciation	<u>54</u>	
Net Book Value		1,641
Net Current Assets		<u>14</u>
		<u>1,655</u>

Liabilities

Capital Stock		300
Loans:		
Allocation IBRD Loans	337	
less Amortization	<u>10</u>	
		327
Domestic Loans	928	
less Amortization	<u>26</u>	
		<u>902</u>
		1,229
Balance Profit and Loss		<u>126</u>
		<u>1,655</u>

ANNEX B-1

A. Enso-Gutzeit Oy

Estimated Cost

Kaukopaa Sulphate Mill

Black liquor recovery furnace		\$	939,000
Steam turbine	Sw. Fr.		1,200,000
Digesters (5)	DM		650,000
	S. Kr.		520,000

Total equivalent \$ 1,475,000

B. Kymin Oy - Kymmene AB

Estimated Cost

Kymin Sulphite Mill

Boiler with accessories	Dmk		5,460,000
Apparatus for developing chlorine dioxide	Fr. Fr.		42,000,000
Imperial filter	Dmk		8,400

Kymin Paper Mill

Two suction presses	Dmk		294,000
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Voikka Groundwood Mill

Three grinders	Dmk		1,385,000
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Voikka Newsprint Mill

Two pressure slicers		\$	228,000
Two pickups and inverse third presses		\$	633,000
Additions to two electric drives	S. Kr.		1,060,000

Total equivalent \$ 2,889,000

C. W. Rosenlew and Co.

Estimated Cost

Kraft Paper Mill

Kraft paper machine	Dmk	4,500,000
Rebuilding etc. of 3 old paper machines and auxiliary machines	Dmk	810,000

Sulphate Mill

Chipper, chip screen and conveyers	S. Kr.	200,000
Digesters	" "	250,000
Diffusers	" "	230,000
Evaporator equipment	" "	240,000
Pulp making equipment	" "	55,000
Steam power distribution	Dmk	27,000
Pulp making equipment	Dmk	585,000
Digesters	\$	62,000
Mixer	\$	236,000
Black liquor recovery equipment	Sw.Fr.	400,000
Black liquor recovery equipment	\$	550,000

Total equivalent \$ 2,539,000

D. A. Ahlstrom Oy

Estimated Cost

Warkaus Groundwood Mill

Two continuous grinders	Dmk	680,000
Rottrom screen	Dmk	46,000
	Dmk	<u>726,000</u>

Total equivalent \$ 173,000

E. Aanokeski Oy

Estimated Cost

Evaporation plant for sulphite waste liquor	S.Kr.	1,000,000
Generator for Hilmo water power plant	Dmk	325,000

Total equivalent \$ 270,000

# FINLAND

- POWER PLANTS ○
- SUBSTATIONS ●
- 380 KV LINE (TO BE CONSTRUCTED) - - -
- 220KV LINE (EXISTING OR UNDER CONSTRUCTION) ———
- 110 KV LINES ———
- WOODWORKING PLANTS ■

