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INDUSTRIAL DEVELOPMENT COMMITTEE
STATE ELECTRICITY AUTHORITY

REPORT

on Alternative Electric Power
developments in Iceland

Annex I

Alternative A Revised

August 1964

Notes to the Tables

The accompanying tables represent a further study of one of the three alternatives discussed in Part I to Part II of the Report on Alternative Power Developments in Iceland. This is Alternative A where 105 MW are developed in one stage at Búrfell in the Thjórsá river providing power for an aluminium smelter as well as power for the North and South-Iceland power markets. The smelter is assumed to be located in the South near Reykjavík. The amended alternative is designated A I.

The changes in assumptions from A to A I are as follows:

- 1) The initial 105 MW Búrfell development is completed late in 1968 instead of 1967.
- 2) The interconnection between the Rjúkandi and Andakill power stations in Western Iceland and the extension of the converter station at the Nato Base is delayed until late 1968.
- 3) The 7 MW extension of Ljósafoss power station is omitted.
- 4) The Laxá system in the North is connected to the Búrfell station late in 1972 instead of 1967.
- 5) A new 10 MW gasturbine station at Akureyri is added to the Laxá system in 1967. Its construction cost, exclusive interest, duties and taxes is estimated to be 0.8 million dollars.
- 6) The construction cost of each of the two 20 MW gasturbine sets in the South is lowered by 0.4 million dollars.
- 7) A surface power house at Búrfell instead of an underground power house is assumed. It is estimated that this will lower the construction cost of the initial Búrfell development by some 4%. This reduction is however not taken into account partly because of some increases in local costs which have occurred since alternative A was analysed but mostly because it might be advisable to add certain items which hitherto have been considered the responsibility of other power companies.
- 8) The price of power and energy is assumed to be increased by a further 10% at the end of 1964 and lowered again at the end of 1968

when a large block of cheaper power becomes available from Būrfell. This increase is in addition to the general increase of 14% assumed throughout the period.

- 9) An unspecified income from an increase in the price of power of \$ 250,000 per year is assumed in the period 1969-1973. This would be about equivalent to an increase of 0.5 mill to the smelter.
- 10) Borrowing for the initial stage of Būrfell is decreased from \$ 22.2 million to \$ 19.8 million and borrowing for Būrfell II decreased from \$ 3.4 million to \$ 2.3. No borrowing is now assumed for the transmission to the North, reservestation and the two last stages at Būrfell thus reducing borrowing by additional \$ 12.0 million.

Other assumptions are the same as in Parts I and II of the report. The most important ones are listed below:

Rate of interest: 6% p. a.

Loan period-hydro: 25 years including 5 years grace.

Amortization: Straight line 40 years for hydro- and reserve stations (gas turbines).

Price to smelter: 2.5 US mills per KWh.

Price to distributing companies: \$ 22.70 per KW of maximum demand plus 1.37 mills per KWh.

It should be noted that valuation of the existing system and its depreciations are based on a revaluation of historical costs which is approximately \$ 300 per KW of capacity in hydro stations.

In Part II it was assumed that interest income on accumulated cash surplus and increases in working capital would cancel each other out and both were omitted. Here provision is made for increases in working capital other than cash to the amount of 20% of annual increases in income from general load and 10% initially from sales to the smelter. No income is on the other hand assumed from interest on accumulated cash surplus.

As regards the Sog and Laxå systems up to 1969 and 1973 respectively power sales are estimated as follows:

Power Sales of the Laxá System up to 1973.

Year		'64	'65	'66	'67	'68	'69	'70	'71	'72
Laxá Hydro	GWh	62	65	68	70	72	74	76	77	78
Akureyri Thermal	"	1	2	4	6	9	12	16	20	24
	GWh	63	67	72	76	81	86	92	97	102
Hydro and Thermal	MW	12.6	13.6	14.6	15.7	17.0	18.0	19.0	21.0	23.0

Power Sales of the Sog System up to 1969.

Year		'64	'65	'66	'67	'68
Sog Hydro	GWh	362	383	404	427	448
Purchased from Ell. Hydro	"	5	5	5	5	5
Ditto from Ell. Therm.	"	1	1	1	5	10
	GWh	368	389	410	437	463
Sog Hydro, off peak	GWh	93	72	51	28	7
Hydro and Thermal	MW	76.5	80.6	84.9	89.9	95.0

The power purchases from the Ellidaar stations are reflected in the operations costs of the Sog system.

The off peak energy is based on the assumption that the Sog stations, exclusive the 7 MW extension of the Ljósafoss station, can deliver 500 GWh/Year. In most years they can, however, deliver more so it is to be hoped that considerably more off peak energy can be delivered than estimated above.

The principal financial results of the new alternative A I are compared with those of the original alternative A in table 10 below. On that account A I is a significant improvement on A financially.

Table 1

Alternative A 1
Power Development

Year	Existing Hydro MW	Thermal Peak MW	Burfell MW	Total Producing st. MW	General Load		Smelter Load MW	Total Load MW	Reserve Power		
					South MW	North MW			Existi. st. MW	New st. MW	Total Peak MW
69	92	-	105	197	124	-	55	179	35	-	35
1970	92	-	105	197	133	-	55	188	35	20	55
71	92	-	105	197	141	-	55	196	35	20	55
72	104	19	105	228	150	23	55	228	49	40	70
73	104	-	140	244	159	25	55	239	49	40	89
74	104	6	140	250	169	26	55	250	49	40	83
1975	104	18	140	262	179	28	55	262	49	40	71
76	104	-	175	279	194	29	55	278	49	40	89
77	104	13	175	292	206	31	55	292	49	40	76
78	104	-	210	314	219	33	55	307	49	40	89
79	104	8	210	322	232	35	55	322	49	40	81

Note: It is here assumed that the Lexa System will be connected to the Burfell-Sog System at the end of 1971.

Table 2

Alternative A 1

Power Production.

Year	Total Load		Prod. Andak. Rjukandi		Prod. Sog Laxa		Production Burfell		Prod. Thermal		Total Prod.	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
69	179	1311	4.5	32	87.5	500	87	779	-	-	179	1311
1970	188	1350	4.5	32	87.5	500	96	818	-	-	188	1350
71	196	1391	4.5	32	87.5	500	104	850	-	-	196	1382
72	228	1544	4.5	32	99.5	585	105	850	19	25	228	1490
73	239	1597	4.5	32	99.5	585	135	980	-	-	239	1597
74	250	1656	4.5	32	99.5	585	140	1032	6	7	240	1656
1975	262	1714	4.5	32	99.5	585	140	1073	18	24	262	1714
76	278	1912	4.5	32	99.5	585	174	1295	-	-	278	1912
77	292	1975	4.5	32	99.5	585	175	1342	13	16	292	1975
78	307	2043	4.5	32	99.5	585	203	1426	-	-	307	2043
79	322	2116	4.5	32	99.5	585	210	1490	8	9	323	2116

Note: In years 71-72 off-peak load must be reduced unless it can be met by secondary energy production, which however is not considered here.

Table 3

Alternative A 1

Construction Cost exclusive Import Duties and Taxes and Interest during Construction. Operation and Maintenance Costs and Fuel Cost. Amounts in Millions of U.S.\$.

Year	Construction			Operat. and Mainten.				Fuel		
	Burfell and Transm. Rvk.	Transm. to North	Gas Turbines South	Total Cost	Burfell and Transm. Rvk	Transm. to North	Gas Turbines South	Peak Cost	Reserve Cost	Total Cost
Before										
64	0.80	-	-	0.80	-	-	-	-	-	-
64	0.30	-	-	0.30	-	-	-	-	-	-
1965	2.77	-	-	2.77	-	-	-	-	-	-
66	6.80	-	-	6.80	-	-	-	-	-	-
67	6.81	-	-	6.81	-	-	-	-	-	-
68	7.46	-	0.3	7.76	-	-	-	-	-	-
69	-	-	1.1	1.10	0.30	-	-	-	0.05	0.05
1970	0.15	-	0.3	0.45	-	-	0.02	-	0.08	0.08
71	2.31	0.80	1.1	4.21	-	-	-	-	0.08	0.08
72	1.63	1.25	-	2.88	-	-	0.02	0.23	0.12	0.35
73	0.16	-	-	0.16	0.13	0.02	-	-	0.12	0.12
74	3.57	-	-	3.57	-	-	-	-	0.12	0.18
1975	3.23	-	-	3.23	-	-	-	0.06	0.12	0.18
76	0.54	-	-	0.54	0.09	-	-	0.22	0.12	0.34
77	0.88	-	-	0.88	-	-	-	-	0.12	0.12
78	-	-	-	-	0.07	-	-	0.15	0.12	0.27
79	-	-	-	-	-	-	-	-	0.12	0.12
80	-	-	-	-	-	-	-	0.08	0.12	0.20
								0.08	0.12	0.20

Table 4

Alternative A 1
Power Sales

Year	Sog		Laxa		Burfell		Burfell		Therm. St.	
	MW	General Load GWh	MW	General Load GWh	MW	General Load GWh	MW	Smelter GWh	MW	General Load GWh
69	83	355	"	"	31	181	52	445	"	"
1970	83	355	"	"	39	217	52	445	"	"
71	83	355	"	"	47	254	52	445	"	"
72	83	355	11.5	75	48	294	52	445	18	23
73	83	355	11.5	75	76	365	52	445	"	"
74	83	355	11.5	75	81	411	52	445	5.5	6
1975	83	355	11.5	75	81	449	52	445	17	22
76	83	355	11.5	75	113	551	52	445	"	"
77	83	355	11.5	75	114	593	52	445	12.5	15
78	83	355	11.5	75	141	670	52	445	"	"
79	83	355	11.5	75	148	728	52	445	7.5	8

off peak

off peak

Existing and Future System

ALTERNATIVE A I

Table 5

BALANCE SHEETS (END OF YEAR)

(In millions of dollars)

	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Assets																		
Fixed Assets in Operation																		
Existing System	30.21	30.21	30.44	30.44	30.44	30.44	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09
Future System						0.80	27.65	29.05	30.45	36.72	36.72	36.72	36.72	43.68	43.68	45.10	45.10	45.10
Less: Depreciation	7.98	8.75	9.53	10.32	11.11	11.88	12.29	13.05	13.81	14.57	15.33	16.09	16.85	17.61	18.37	19.04	19.70	20.35
Existing System						0.02	0.71	1.44	2.17	2.93	3.85	4.77	5.69	6.78	7.87	9.00	10.13	11.26
Future System							44.74	44.65	43.16	43.04	47.63	45.95	44.27	49.38	47.53	47.15	45.36	43.58
Net Fixed Assets in Operation	22.23	21.46	20.91	20.12	19.33	19.34	44.74	44.65	43.16	43.04	47.63	45.95	44.27	49.38	47.53	47.15	45.36	43.58
Work-in-Progress	0.23																	
Existing System	1.10	1.10	3.93	11.01	19.23	27.15	1.40	0.45	4.69	6.27	0.16	3.73	6.96	0.54	1.42			
Future System	0.88	1.15	1.58	1.75	1.95	2.09	2.70	3.75	2.44	2.58	4.86	3.91	3.45	5.63	9.08	13.74	18.79	23.97
Net Current Assets	23.11	23.94	26.42	32.88	40.51	48.58	48.84	48.85	50.29	51.89	52.65	53.59	54.68	56.25	58.03	60.89	64.15	67.55
Total Assets																		
Liabilities																		
New Equity	1.10	1.40	1.40	2.30	3.90	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Existing Equity	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35	10.35
Earned Surplus	0.45	1.36	2.45	3.72	5.15	5.15	6.34	7.81	9.59	11.57	13.77	16.05	18.56	21.70	25.16	29.25	33.75	38.37
Total Equity	10.35	11.90	13.11	15.10	17.97	20.50	21.69	23.16	24.94	26.92	29.12	31.40	33.91	37.05	40.51	44.60	49.10	53.72
Debt:																		
- Existing System	12.76	12.04	11.17	10.26	9.30	8.29	7.36	6.44	5.48	4.61	3.82	3.17	2.48	1.74	0.95	0.66	0.41	0.24
- Búrfell I			2.14	7.52	13.24	19.79	19.79	19.25	18.68	18.07	17.42	16.73	16.00	15.23	14.41	13.54	12.62	11.65
- Búrfell II									1.19	2.29	2.29	2.29	2.29	2.29	2.16	2.09	2.02	1.94
Total Debt	12.76	12.04	13.31	17.78	22.54	28.08	27.15	25.69	25.35	24.97	23.53	22.19	20.77	19.20	17.52	16.29	15.05	13.83
Total Liabilities	23.11	23.94	26.42	32.88	40.51	48.58	48.84	48.85	50.29	51.89	52.65	53.59	54.68	56.25	58.03	60.89	64.15	67.55

1981 1982 1983

4183 4208 3833
-9.72 810 7.84

Exbury

Existing and Future System

ALTERNATIVE A I.
INCOME STATEMENT.

Table 6

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Power Sales																	
Primary Power in MW	89.1	94.2	99.5	105.6	112.0	132.0	141.0	151.0	160.5	170.5	181.0	192.5	207.5	221.0	235.5	250.0	250.0
Primary Energy in GWh	431	456	482	513	544	622	664	706	747	795	847	901	981	1038	1100	1166	1166
Off-peak in GWh	93	72	51	28	7	200	200	192	151	200	200	200	300	300	300	300	300
Aluminum Smelter in GWh	-	-	-	-	-	445	445	445	445	445	445	445	445	445	445	445	445
(In millions of dollars)																	
Revenue Account																	
Income from Primary Power	1.88	2.36	2.49	2.64	2.80	3.00	3.20	3.43	3.64	3.87	4.11	4.37	4.71	5.02	5.35	5.68	5.68
" " Primary Energy	0.54	0.69	0.73	0.77	0.82	0.85	0.91	0.97	1.02	1.09	1.16	1.23	1.34	1.42	1.51	1.60	1.60
" " Off-Peak Energy	0.06	0.04	0.03	0.02	0.00	0.27	0.27	0.26	0.21	0.27	0.27	0.27	0.41	0.41	0.41	0.41	0.41
Total Income from General Load	2.48	3.09	3.25	3.43	3.62	4.12	4.38	4.66	4.87	5.23	5.54	5.87	6.46	6.85	7.27	7.69	7.69
Income from Aluminum Smelter	-	-	-	-	-	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
(Unspecified income)	-	-	-	-	-	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Total Income	2.48	3.09	3.25	3.43	3.62	5.46	5.72	6.00	6.21	6.57	6.88	7.21	7.80	8.19	8.61	8.80	8.80
Operation Maintenance and Administration Expenses:																	
Existing System	0.42	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Future System	-	-	-	-	-	0.32	0.34	0.34	0.34	0.34	0.50	0.50	0.59	0.59	0.66	0.66	0.66
Fuel for Thermal Generation	0.02	0.04	0.06	0.13	0.19	0.18	0.26	0.30	0.35	0.12	0.18	0.34	0.12	0.27	0.12	0.20	0.20
Contribution to Reserve Capacity	0.23	0.42	0.42	0.39	0.38	0.37	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.21
Depreciation:																	
Existing System	0.77	0.78	0.79	0.79	0.77	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.65
Future System	-	-	-	-	-	0.69	0.73	0.73	0.76	0.92	0.92	0.92	1.09	1.09	1.13	1.13	1.13
Total Expenses	1.44	1.67	1.70	1.74	1.81	2.75	2.77	2.81	2.96	2.98	3.04	3.20	3.24	3.39	3.26	3.33	3.28
Net Income	1.04	1.42	1.55	1.69	1.81	2.71	2.95	3.19	3.31	3.59	3.84	4.01	4.56	4.87	5.12	5.47	5.52
Interest:																	
Existing System	0.59	0.51	0.46	0.42	0.38	0.33	0.29	0.25	0.21	0.17	0.15	0.13	0.09	0.07	0.04	0.03	0.02
Future System	-	0.06	0.28	0.61	0.96	1.19	1.19	1.19	1.22	1.22	1.18	1.14	1.10	1.04	0.99	0.94	0.88
Less interest during construction	-	0.06	0.28	0.61	0.96	-	-	0.03	0.10	-	-	-	-	-	-	-	-
Net Interest	0.59	0.51	0.46	0.42	0.38	1.52	1.48	1.41	1.33	1.39	1.33	1.27	1.19	1.11	1.03	0.97	0.90
Net Profit	0.45	0.91	1.09	1.27	1.43	1.19	1.47	1.78	1.98	2.20	2.51	2.74	3.37	3.69	4.09	4.50	4.62
Cumulative Net Profit	0.45	1.36	2.45	3.72	5.15	6.34	7.81	9.59	11.57	13.77	16.06	18.56	21.70	25.12	29.25	33.75	38.37

Handwritten notes and corrections in the right margin of the table, including values like 3.18, 4.01, 4.56, 4.80, 5.35, 3.84, 2.74, 3.37, 3.69, 4.09, 5.12, 5.47, 5.52, 1.19, 2.66, 4.44, 6.20, 8.49, 11.0, 13.74, 17.11, 20.80, 25.12, 29.62, 34.24.

Table 7

ALTERNATIVE A 1
SOURCE AND APPLICATION OF FUNDS

(in millions of dollars)

Existing and Future System

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Source of Funds																	
Net Income	1.04	1.42	1.55	1.69	1.61	2.71	2.95	3.19	3.31	3.59	3.80	4.01	4.56	4.80	5.35	5.47	5.52
Depreciation	0.77	0.78	0.79	0.79	0.79	1.45	1.49	1.49	1.52	1.68	1.68	1.68	1.85	1.85	1.80	1.79	1.78
Net Receipt from Operation	1.81	2.20	2.04	2.48	2.60	4.16	4.44	4.68	4.83	5.27	5.29	5.46	6.42	6.42	6.92	7.26	7.30
(New Equity (Cash))	1.10	0.30	0.90	1.60	1.10												
Borrowings (included capitalized interest):	0.17	2.14	5.38	5.70	6.55			1.19	1.10								
(Existing System)																	
Bürfell I																	
Bürfell II																	
Total Borrowings	0.17	2.14	5.38	5.70	6.55			1.19	1.10								
Total Source of Funds	3.08	4.64	8.62	9.80	10.25	4.16	4.44	5.87	5.93	5.27	5.29	5.46	6.18	6.42	6.92	7.26	7.30
Application of Funds																	
Increase in Working-Capital	0.05	0.12	0.03	0.03	0.03	0.21	0.05	0.05	0.04	0.07	0.06	0.07	0.12	0.08	0.08	0.08	0.00
Construction Expenditure (excluding capitalized interest):	0.23			0.80													
(Existing System)																	
(Gasthybinastation Akureyri)																	
North-South HT Line					0.30	1.10	0.30	1.10									
Reserve Station I																	
Reserve Station II					7.46												
Bürfell I							0.15	2.3	1.63								
Bürfell II																	
Bürfell III																	
Bürfell IV																	
Total Construction Expenditure	1.33	2.77	6.80	7.61	7.76	1.10	0.45	4.21	2.88	0.16	3.57	3.23	0.54	0.88			
Debt-Service:																	
Interest-Existing System	0.59	0.51	0.46	0.42	0.38	0.33	0.29	0.25	0.21	0.17	0.15	0.13	0.09	0.07	0.04	0.03	0.02
- Bürfell I																	
- Bürfell II																	
Total Interest	0.59	0.51	0.46	0.42	0.38	0.33	0.29	0.25	0.21	0.17	0.15	0.13	0.09	0.07	0.04	0.03	0.02
Amortization - Existing System	0.89	0.87	0.91	0.96	1.01	0.93	0.92	0.96	0.87	0.79	0.65	0.69	0.74	0.77	0.82	0.87	0.97
- Bürfell I																	
- Bürfell II																	
Total Amortization	0.89	0.87	0.91	0.96	1.01	0.93	0.92	0.96	0.87	0.79	0.65	0.69	0.74	0.77	0.82	0.87	0.97
Total Debt Service	1.48	1.44	1.65	1.99	2.35	2.45	2.94	2.97	2.91	2.83	2.67	2.69	2.76	2.79	2.26	2.21	2.12
Total Application of Funds	2.86	4.33	8.48	9.63	10.14	3.76	3.44	7.23	5.83	3.06	6.30	5.99	3.42	3.75	2.99	2.99	2.12
Cash Surplus	0.22	0.31	0.14	0.17	0.11	0.40	1.00	-1.36	0.10	2.21	-1.01	-0.53	2.76	2.67	4.81	4.97	5.18
Cumulative Cash Surplus	0.22	0.53	0.67	0.84	0.95	1.35	2.35	0.99	1.09	3.30	2.29	1.76	4.52	7.19	11.77	16.74	21.92

Handwritten notes and corrections in the right margin, including values like 1.40, 1.04, 14, 2.35, 1.27, 4.26, 7.16, 11.97, 16.94, 22.12, and 21.92.

Table 8

ALTERNATIVE A I.
WORK-IN-PROGRESS
(In millions of dollars)

Future System	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Construction Cost														
Reserve Station Akureyri			0.80											
Reserve Station I				0.30	1.40									
Reserve Station II						0.30	1.40							
North-South H. T. Line								0.80	2.05					
Búrfell I	1.10	3.87	10.67	17.48	24.94									
Búrfell II						0.15	2.46	4.09						
Búrfell III									0.16	3.73	6.96			
Búrfell IV												0.54	1.42	
Interest during construction	0.06	0.34	0.95	1.91	0.03	0.13								
Total Work-in-progress	1.10	3.93	11.01	19.23	27.35	1.40	0.45	4.69	6.27	0.16	3.73	6.96	0.54	1.42

Future System

ALTERNATIVE A I.
DEPRECIATION.

Table 9

(In millions of dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Replacement Value													
H.T. Line	2.05					0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Reserve Station AK	0.80	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Reserve Station I	1.40		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Reserve Station II	1.40				0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Búrfell I	26.85	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Búrfell II	4.22					0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Búrfell III	6.96								0.17	0.17	0.17	0.17	0.17
Búrfell IV	1.42										0.04	0.04	0.04
Total	45.10	0.02	0.69	0.73	0.76	0.92	0.92	0.92	1.09	1.09	1.13	1.13	1.13

ALTERNATIVE A I.

Existing and Future System

Debt Service and Interest Coverage and Return on Net Fixed Assets in Operation.
(In millions of dollars)

	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
<u>Debt Service Coverage</u>																	
Debt Service	1.48	1.44	1.65	1.99	2.35	2.45	2.94	2.97	2.91	2.83	2.67	2.69	2.76	2.79	2.26	2.21	2.12
Less: Interest during construction	0.06	0.06	0.28	0.61	0.96		0.03	0.10									
Net Debt Service	1.48	1.38	1.37	1.38	1.39	2.45	2.94	2.94	2.81	2.83	2.67	2.69	2.76	2.79	2.26	2.21	2.12
Net Receipt from operation	1.81	2.20	2.34	2.48	2.60	4.16	4.44	4.68	4.83	5.27	5.29	5.46	6.18	6.42	6.92	7.26	7.30
Debt Service Coverage A I	1.2	1.6	1.7	1.8	1.9	1.7	1.5	1.6	1.7	1.9	2.0	2.0	2.2	2.3	3.1	3.3	3.4
Debt Service Coverage Alt. A	1.2	1.4	1.5	1.5	1.2	1.5	1.3	1.3	1.3	1.4	1.5	1.6	1.6	1.6	1.9	2.0	2.1
<u>Interest Coverage</u>																	
Net Interest	0.59	0.51	0.46	0.42	0.38	1.52	1.48	1.41	1.33	1.39	1.33	1.27	1.19	1.11	1.03	0.97	0.90
Net Income	1.04	1.42	1.55	1.69	1.81	2.71	2.95	3.19	3.31	3.59	3.61	3.78	4.33	4.57	5.12	5.47	5.52
Interest Coverage A I	1.8	2.8	3.4	4.0	4.8	1.8	2.0	2.3	2.5	2.6	2.7	3.0	3.6	4.1	5.0	5.6	6.1
Interest Coverage A	1.8	2.2	2.7	2.7	1.0	1.4	1.5	1.7	1.7	1.7	2.0	2.2	2.1	2.4	2.7	3.3	3.3
<u>Rate of Return</u>																	
Net Income	1.04	1.42	1.55	1.69	1.81	2.71	2.95	3.19	3.31	3.59	3.61	3.78	4.33	4.57	5.12	5.47	5.52
Net fixed assets in operation	21.46	20.91	20.12	19.33	19.34	44.74	44.65	43.16	43.04	47.63	45.95	44.27	49.38	47.53	47.15	45.36	43.58
Rate of Return A I	4.8	6.8	7.7	8.7	9.4	6.1	6.6	7.4	7.7	7.5	7.9	8.5	8.8	9.6	10.9	12.1	12.7
Net Income	1.05	1.14	1.26	1.31	1.94	2.50	2.80	3.05	3.06	3.31	3.62	3.85	4.26	4.59	5.05	5.44	5.47
Net Fixed assets in Operation	21.46	20.91	20.12	21.19	48.69	47.15	47.43	45.85	46.08	48.57	46.84	45.11	50.52	48.60	48.22	46.37	44.53
Rate of Return A	4.9	5.5	6.3	6.2	4.0	5.3	5.9	6.7	6.6	6.8	7.7	8.5	8.4	9.4	10.5	11.7	12.3

Existing and Future System

ALTERNATIVE A I.

Table 11

Financing of Investment and

Free Cash Surplus.

(In millions of dollars)

Years	1.	2.	3.	4.	5.		6.	7.	8.
					Loans	New equity			
	Construction expenditure	Interest during construction	Investment including capitalized interest		Financed by	Reinvested cash surplus	Free Cash surplus	Cumulative Free Cash Surplus	
1964	1.33		1.33	0.17	1.10	0.06	0.22	0.22	
1965	2.77	0.06	2.83	2.14	0.30	0.39	0.31	0.53	
1966	6.80	0.28	7.08	5.38	0.90	0.80	0.14	0.67	
1967	7.61	0.61	8.22	5.72	1.60	0.90	0.17	0.84	
1968	7.76	0.96	8.72	6.55	1.10	1.07	0.11	0.95	
1969	1.10		1.10		1.10	1.10	0.40	1.35	
1970	0.45 +		0.45		0.45	0.45	1.00	2.35	
1971	4.21	0.03	4.24	1.19		3.05	-1.36	0.99	
1972	2.88	0.10	2.98	1.10		1.88	0.10	1.09	
1973	0.16		0.16			0.16	2.21	3.30	
1974	3.57		3.57			3.57	-1.01	2.29	
1975	3.23		3.23			3.23	-0.53	1.76	
1976	0.54		0.54			0.54	2.76	4.52	
1977	0.88		0.88			0.88	2.67	7.19	
1978							4.58	11.77	
1979							4.97	16.74	
1980							5.18	21.92	
	43.29	2.04	45.33	22.25	5.00	18.08	21.92		

