INDUSTRIAL DEVELOPMENT COMMITTEE
STATE ELECTRICITY AUTHORITY

REPORT

on Alternative Electric Power developments in Iceland

Part 1.

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I. INTRODUCTION

The present report gives the results of a detailed study of what are now considered the three main alternative lines of development in the field of electric power production in Iceland. The available choices are more varied and contrasting than ever before because of new developments which open the possibilities for a radical change in the scale of new power plants and consequently in the cost of production of electricity.

The most important new factor is the possibility of an aluminium smelter being built and operated in Iceland by foreign companies who would purchase electric power under a long-term power sales contract. The initial size of the smelter is expected to be for a p.a. production of 30 000 tons. This is large enough to make it feasible to undertake to build a hydro-electric power plant at Búrfell in the Thjórsá river which would initially be about twice as large as would be warranted by the needs of the domestic power market in Iceland. This increase in size of power plants is of decisive importance if the great available resources of cheap- hydro-electric power in Iceland are to be developed.

Another development pointing in the same direction is the increasing integration of the domestic distribution network. The next major step to be taken in this field is the building of a high tension transmission link between the Sog System in South West and the Laxá System in North, see exhibit B. This would make it possible to avoid building small uneconomic plants in the North, and generally favour the development of larger more economic power plants.

The time is fast approaching when a decision has to made on the next stage in development of power for the South-West of Iceland which today represents about 80% of the market. New capacity of not less than 20-30 MW must be brought into commission by the end of 1967 to be followed by similar expansion 3 or 4 years later. There is also need for further capacity in the North by 1968 and 1969, but a final decision can still be postponed for a year or two.

It is extremely important that a decision on the next stage in power development after the Sog has been fully developed should be based on the closest study of available alternatives taking into account the longer term possibilities of harnessing the cheap hydro-electric power resources of the Icelandic glacial rivers and comparing those with smaller units, including geothermal plants.

A prolonged study of all available alternatives has resulted in the selection of three basic alternatives which as near as possible reflect the most important choices involved. These alternatives will now be briefly described.

Alternative A. This alternative represents the cheapest way of providing power for a smelter as well as a transmission link between the South-West and the North. It is envisaged to develop 105 MW in one stage at Búrfell and providing power for a smelter near the load centre in Reykjavík, thus avoiding extra transmission costs. The transmission line to the North would be a low cost line with two conductors designed only for the moderate load needed to supply the North. After the first stage it is assumed that Búrfell will be developed in three further stages of 35 MW each.

Alternative B. This alternative is identical to alternative A as regards power development. The difference lies in locating the smelter in North near the load centre of Akureyri. The arguments for such a location for the smelter are mainly based on other considerations than the economics of the power system, and these will be dealt with elsewhere. From the power cost point of view it is clearly more expensive to provide power for the smelter in the North. This would call for a full-scale transmission line from Búrfell to the North and reserve power at Akureyri which would have to come earlier than in the South. Against this come the longterm benefits of having a full-scale transmission line to the North which would facilitate the development of the low-cost hydro-electric power available at Dettifoss.

Alternative C. This alternative is designed to represent the cheapest way of providing power for the domestic system in the South-West and the North until 1974 assuming that no new major industrial user will be forthcoming. In the South-West a geothermal plant of 30 MW would be built to be followed by a 22 MW hydro plant at Efstidalur. It has not been found economical to build a transmission line to the North under these circumstances and is assumed that a small 7 MW plant will be built in the Laxá to supply the North. Attempts have been made to keep investment down to a minimum, and it is likely that an initially more expensive line of development would in practice be chosen, particularly in the North. It is intended to deal more fully with this aspect in a separate report.

II. LOAD AND REVENUE FORECAST.

a. Load Growth.

In a report dated Nov. 1963 and titled "Power Market Study of Iceland" by the Harza Engineering Company International, Chicago, a survey is made of the future market for electricity in Iceland, together with a forecast of the production requirements of power and energy for a period ending with 1982. The country is then divided in four parts, or SW from Rjúkandi to Vestmannaeyjar, NW, N from Blönduós to Thórshöfn and E, see Exhibit A.

The areas under discussion here are SW from Rjúkandi to Vestmannaeyjar and N from Dalvík to Húsavík. The figures for the N-area must therefore be adjusted to cover only the area from Dalvík to Húsavík. After these adjustments have been made the load forecasts including the aluminium smelter under discussion are shown in table 1. All figures refer to production and thus include losses.

The Harza report also shows the historic production from 1952 and how it is divided on domestic, commercial and industrial consumption, space heating, public lighting etc., but a more detailed break down can be found in "Orkumál", published by the State Electricity Authority. Due to good records for past years of energy consumption by various classes of consumers and the extensive electrification and high consumption per caput in Iceland Harza has based the load forecasts for the ordinary load on trend analysis rather than comparative utilization or specific load estimates. It will be noted that Harza assumes that the fertilizer production will be increased in 1969 and 1967 and that the fertilizer factory will be operated mainly with off-peak energy as has been done in the past. This is however not certain as fuel might be used instead of electricity but in that case available off-peak energy (together with some peak-energy) would most probably be used for space heating in all areas where geothermal heating is not more economical. In alternative A and B the Harza estimate therefore seems reasonable as it stands whereas in alternative C increased fertilizer production or space heating would not be possible, see table 1.

Forecasts of power sales 1964-1980 derived from table 1 as well as revenue from power sales are included in income statements for each alternative in projections of financial operation in Part II of this report. It is, however, not possible to satisfy all the demand for secondary energy in the period 1964-1967 as shown in table 1 with energy from hydro plants. Secondary energy sales and revenue are therefore progressively reduced in this period.

b. Pricing of power to distributing companies.

The pricing of power from the Sog system is limited by law to "cost plus 5 per cent". Cost has been interpreted to include amortization of loans in stead of depreciation. Debt is to a large extent in foreign currencies and prices have accordingly been increased as a result of devaluations. The principle behind this pricing formula is clearly no longer appropriate as the system now operates with considerable equity and it is assumed that the formula will be abolished when the new National Power Company commences operations. The pricing policy of the Laxá system is not tied in this way.

The price of power from the Sog system to distributing companies is now $ 19.77 per Kw of peak demand plus 1.235 mills per Kwh. The price has remained unchanged since the end of 1961 when it was increased by 25% as a result of devaluations in 1960 and 1961. Another 25% increase was made at the end of 1959. The prices of the Laxá system are a little higher or from $ 19.77 up to 26.74 per Kw of peak demand plus 1.40 mills per Kwh. The energy component has just recently been increased from 1.16 mills per Kwh.

It is assumed that by the end of 1964, after the merger of the two systems, prices will be equalized at a level about 14 per cent higher than the present price of the Sog system. The power component is assumed to increase to $ 22.70 per Kw (14.8%) and the energy component to 1.37 mills per Kwh (11.1%).

c. Pricing of power to the fertilizer plant.

The fertilizer plant now purchases secondary energy for production of hydrogen at the very low price of 0.6 mills per Kwh. The present power contract expires in 1968. It is assumed that the price remains unchanged until then, when it is assumed to be more than doubled under a new power contract. The fertilizer plant would then pay a price for off-peak energy equal to the energy conponent of the price to distributing companies i.e. 1.37 mills per Kwh. It is further assumed that off-peak energy for expansion of fertilizer production in alternatives A and B will be sold at 1.37 mills per Kwh.

Sales of power to the fertilizer plant other than off-peak are assumed to be at the same price as to distributing companies.

d. Smelter load and revenue.

It is assumed that a 30.000 ton aluminium smelter will start operations in 1968 requiring deliveries of 445 Gwh of energy annually. No increase in the capacity of the smelter later on is assumed. The price of energy sold to the smelter is assumed to be 2.5 mills per Kwh during the first 25 years and 3.0 mills per Kwh for 15 years after that. This price is assumed in all the calculations shown in the tables attached to this report. The effects of higher prices i e. 3.0 and 3.5 mills per Kwh, have also been calculated and these are shown separately in Chapter V below.

III. DESCRIPTIVE ACCOUNT OF THE ASSUMPTIONS UNDERLYING EACH ALTERNATIVE.

a. Existing Power Systems.

Exhibit A shows the existing power systems in the areas under discussion i.e. the Southwest and the North (from Dalvík to Húsavík). An 11.5 MW and a 2 MW extensions of the thermal stations at respectively Ellidaár and Akureyri are now under construction and it is expected that before the end of 1967 a new 7 MW unit will be added at Sog and the stations Rjúkandi and Andakíll interconnected. Assuming this, the afore-mentioned systems will have the following capacity at the end of 1967 when new developments will have to start operating if heavy fuel consumption is to be avoided and adequate reserve capacity kept in the systems, for not to mention the operation of an aluminium smelter, an extension of the fertilizer factory or increased space heating:

<u>Energy Stations at end of 1967</u>

		Total MW rated capacity	Total GWh/year firm energy
Sog Hydro Plants			
Steingrímsstöd	26.4 MW		
Ljósafoss	21.6 "		
Írafoss	46.5 "	94.5	510
Andakíll Hydro Plant		3.5	25
Rjúkandi " "		1.0	7
Laxá Hydro Plants			
Laxá I	4.0 MW		
Laxá II	8.0 "	12.0	85
		111.0	627

<u>Reserve and Peak Stations at end of 1967</u>

Ellidaár Hydro	2.5
Ellidaár Thermal	19.0
Nato "	7.5
Vestmannaeyjar Thermal	4.0
Akureyri "	4.0
Rjúkandi and Stykkishólmur Thermal	2.0
	39.0

Installed capacity at Ellidaár Hydro is 3.2 MW and in most years it can produce some 5-10 GWh, but as it is an old station (4 units, wherof 2 installed in 1921) it is, after 1967, looked upon as a reserve station only and its capacity deemed to be 2.5 MW.

The energy capability of the Sog plants in an average year is 585 GWh and 470 GWh in a minimum year. On basis of this, the firm energy from Sog is here set at approx. 510 GWh/year or somewhat on the optimistic side. The Laxá plants have in most years an energy capability of 95 GWh and 85 GWh/year of firm energy can be considered a safe figure.

b. Power Developments and Power Production.

It is assumed in all three alternatives that new developments will start operating at the end of year 1967. It should, however, be pointed out that the construction time in alternative C is approx. one year shorter than in alternative A and B.

Alternative A. As previously described this alternative is based on the assumptions that a 210 MW power development on River Thjórsá at Búrfell together with power transmissions to Reykjavík and Akureyri will be built in conjunction with a 30,000 tons/year aluminium smelter in the vicinity of Reykjavík, requiring 55 MW and 470 GWh/year production, see Exhibit B. On basis of this smelter load and the general load forecasts, the following 4 development stages at Búrfell are considered economical (see Harza's report on Búrfell, dated Oct. 1963).

Power Capacity of Búrfell

	MW rated capacity	GWh/year firm energy
Stage I	105 (3x35)	850
Stage II	35	275
Stage III	35	260
Stage IV	35	250
	210	1635

Table 2 shows these stages fitted in with the load schedules and table 3 the estimated production of the various stations in the interconnected system.

It is considered necessary that the available reserve power is never less than the rated capacity of the largest unit in the system, in this case 35 MW, at least during such periods when the capacity of the

Sog and Búrfell stations is anywhere in the neigbourhood of full utilization. As shown in table 2 this is, however, not considered sufficient and 20 MW of gasturbine power is therefore twice added to the existing thermal power, in years 1970 and 1972, respectively. The reasons for this are partly that the Búrfell project provides for only one transmission line to Reykjavík (a second line would cost approx. the same amount as a 20 MW gasturbine station) and partly because of ice troubles, which may occur at Búrfell until adequate water storages have been built in the Thjórsá River Basin, the first step being the initial Thorisvatn Storage included in the third Búrfell stage (1976).

During a temporary outage of Búrfell, the following load reductions are considered possible:

Temporary load reductions

General load	10%
Fertilizer load	100%
Smelter load	50%

The reserve power up to 1974 is based on these assumptions. It is possible that a second transmission line will be preferred in 1972 compared with 20 MW of reserve power, but this should only slightly alter the economy of the system. It is also possible that the Thórisvatn Storage will be built in the second stage rather than a reserve station.

It should be noted here that the gasturbine stations can easily be used as synchronous condensers for power factor correction.

Alternative B. This alternative is similar to alternative A except that the aluminium smelter is here placed in the vicinity of Akureyri, instead of Reykjavík, probably some 9 miles north of town. Table 4, which shows how the various power developments are fitted in with the load schedules, differs from table 2 only as regards the reserve power. Here it is considered necessary to erect initially a 50 MW gasturbine station at the smelter site as the Búrfell Project provides for only one transmission line to Akureyri and the capacity of the Laxá system is only 16 MW. Although the line route from Búrfell to Akureyri is believed to be a good one, this will hardly be considered sufficient and due to the afore-mentioned ice problems at Búrfell and the cost of a second transmission line to Akureyri, the 50 MW gasturbine station is selected here.

This production of the various stations in the interconnected system will be the same as in alternative A, see table 3.

Alternative C. This alternative does not include an interconnection between the North and the South and assumes two smaller stations in the Southwest, i. e. Hveragerdi 2 x 15 MW and Efstidalur 1 x 22 MW and a 1 x 7 MW station in the North, here called Laxá III, utilizing the same head as Laxá I. An extension of the fertilizer factory or increased space heating worth mentioning will not be possible in this case, and the primary load figures for the Southwest in the years after 1968 will therefore have to be lowered accordingly.

The Hveragerdi station would have a rated capacity of 32 MW but as considerable power will probably be needed for pumps etc., compared with a hydro station, the capacity is here set at 30 MW.

According to present estimates, some 70 MW and 400 GWh/year can be developed totally at the Laxá plants site. The afore-mentioned 7 MW station would be the next step in such a development, but another arrangement with a 19 MW capacity might also be economical. As it is difficult to find economical hydro sites of suitable sizes in the Saudárkrókur- and Grímsá-areas, see Exhibit B, the best solution might be to connect Saudárkrókur with Akureyri and Grímsá with Laxá, which would create a more extentive market for a 19 MW Laxá plant. This problem will be dealt with in a separate paper as only the Northern area from Dalvík to Húsavík is here under discussion.

The capacity of the afore-mentioned stations is estimated as follows:

Power capacity in alternative A

	MW rated capacity	GWh firm energy
Hveragerdi	30 (+ 2)	240
Efstidalur	22	160
Laxá III	7	50

Table 5 shows the power developments and table 6 the power production of each station in this alternative. It will be noted that the reserve power in 1974 in the Southwest corresponds to the biggest unit in the system, 22 MW (Efstidalur). It will also be noted that the thermal power at Akureyri is in 1970 increased to 11 MW leaving only 4 MW reserve power in the North in 1974, which is on the low side as the biggest unit in the system is 8 MW (Laxá II).

Power production during 1964-1967 is estimated as follows:

Demand

Sog Hydro	MW	80.5	84.8	89.4	94.6
Andakíll-Vestmannaeyjar	"	4.9	5.4	5.6	5.7
Rjúkandi-Stykkishólmur	"	2.1	2.3	2.5	2.7
	MW	87.5	92.5	97.5	103.0
Laxá Hydro	MW	12.2	12.2	12.1	12.0
Akureyri Thermal	"	1.3	2.3	3.4	4.5
	MW	13.5	14.5	15.5	16.5

Energy

Sog Hydro	GWh	403	426	449	470
Ellidaár Hydro	"	-	-	-	5
Ellidaár Thermal	"	1	1	1	5
Sog Hydro, off-peak	"	105	80	60	40
Ellidaár Hydro, off-peak	"	5	5	5	-
	GWh	514	512	515	520
Andakíll-Vestmannaeyjar	"	26.5	27	27.5	28
Rjúkandi-Stykkishólmur	"	6.5	7	7.5	8
	GWh	547	546	550	556
Laxá Hydro	"	67	70	73.5	75.5
Akureyri Thermal	"	1	2	4.5	6.5
	GWh	68	72	78	82

As pointed out below under "Power Market" this production is not sufficient for the fertilizer factory during 1965-1967.

c. Construction Costs.

All construction cost figures set forth below exclude all import duties and taxes and interest during construction. They are based on current wage rates and prices. Investment costs during 1964-1967 are shown in Part II of this report.

Alternative A. Assuming the power development schedule shown in table 2 the construction costs are estimated by Harza as follows:

Construction costs of Búrfell in millions of U.S. $.

Stage I.						Total
Year	Before 64	64	65	66	67	-
Costs	0.80	0.85	6.62	9.48	7.29	25.04
Stage II:						
Year			70	71	72	-
Costs	-	-	0.15	2.31	1.53	3.99
Stage III.						
Year			73	74	75	-
Costs	-	-	0.16	3.57	3.23	6.96
Stage IV.						
Year				76	77	-
Costs	-	-	-	0.54	0.88	1.42
Stage I-IV						37.41

This figures include a 230 kV transmission to Reykjavík and necessary facilities there to deliver the power to the smelter at 230 kV and to other consumers at 138 kV. They also include in the III stage the initial Thórisvatn Storage.

In addition to this come the gasturbine stations and the transmission to Akureyri. Here, an 115 kV line is selected with a carrying capacity of up to 30 MVA when series condensers are used. In order to cut cost it is assumed that the ground will be used as a third phase, meaning that the line will have only two conductors.

The costs are appraised as follows:

Construction costs of gasturbine stations and an Akureyri transmission in alt. A, in millions of U.S. $.

Year	66	67	68	69	70	71	Total
Transmission Akureyri	0.80	1.25	-	-	-	-	2.05
20 MW gasturbine station			0.40	1.40	-	-	1.80
20 MW gasturbine station	-	-	-	-	0.40	1.40	1.80
	0.80	1.25	0.40	1.40	0.40	1.40	5.65

The above figures are shown in table 7.

Alternative B. Hera, a normal 230 kV line from Búrfell to Akureyri is assumed, with a sufficient carrying capacity for an 110 MW smelter in addition to the ordinary load or totally some 130-140 MW, when the afore-mentioned 50 MW gasturbine station is used as a synchronous condenser for power factor correction.

The cost of this 230 kV transmission (delivering 230 kV power to the smelter and 66 kV power to the ordinary load) and the gasturbine station is appraised as follows:

Construction costs of a gasturbine station and an Akureyri transmission in alt. B, in millions of U.S. $.

Year	66	67	Total
Akureyri transmission	2.00	3.00	5.00
50 MW gasturbine station	0.60	3.40	4.00
	2.60	6.40	9.00

These figures are shown in table 8 together with the cost of the Búrfell development which here is almost the same as in alternative A, except for some rather minor changes in the transformer stations at Búrfell and Reykjavík.

Alternative C. The cost of the various developments is here estimated as follows, see table 9.

Construction costs of the various developments in alt. C, in millions of U.S. $.

Year	Before 64	64	65	66	67	68	69	70	71	Total
Hveragerdi	0.64	-	0.35	2.76	2.69	-	-	-	-	6.44
Efstidalur	0.08	-	-	-	-	-	1.30	2.60	2.47	6.45
Laxá III	0.12	-	0.44	0.93	1.53	-	-	-	-	3.02
Akureyri Thermal	-	-	-	-	-	0.14	0.70	-	-	0.84
	0.84	-	0.79	3.69	4.22	0.14	2.00	2.60	2.47	16.75

The Hveragerdi estimate which includes a new 230 kV transmission line from Sog to Reykjavík (initially used for 138 kV) is made by Merz and McLellan in London and Vermir and Thoroddsen in Reykjavík, and the Efstidalur estimate which includes a 138 kV transmission to Sog, by Harza and Thoroddsen. The Laxá III estimate is made by Thoroddsen. Here, a new line from Laxá to Akureyri is not considered absolutely necessary, but it is assumed that the existing line will be strengthened somewhat. The cost of the extension of the thermal station at Akureyri is appraised.

d. Operation, Maintenance and Fuel Costs.

Operating and maintenance costs mean here average cash expenditure over a considerable period of time, necessary for normal operation and maintenance. They do not include taxes, water rights, insurance, reserve funds, profit etc.

Table 7, 8 and 9 show the estimated O & M and fuel costs for the various alternatives. As it must be expected that the reserve capacity in alternatives A and B will be used occasionally, a certain amount of fuel cost is added because of this. The gasturbine stations in alt. A and B would be automatically operated, and as they are mainly reserve stations it is expected that their maintenance cost will be low. In alternative C the maintenance cost of the Akureyri thermal station will be relatively much higher because of the energy production alloted to it.

O & M costs and fuel costs during 1964-1967 are shown in Part II of this report.

e. Power Market.

Table 1 shows the load forecasts and table 3 and 6 the estimated load contribution of each station in the various alternatives. It must be pointed out here that it is somewhat doubtful if tables 3 and 6 are correct, as detailed (computer-) studies of the power systems discussed have not yet been made, but it is believed that they reflect the essential truth, at least as regards the power demand component. The Sog stations, having water storage, will obviously be used for peaking together with the thermal stations, but a detailed study may show that in certain years the firm energy of the base load stations can not be utilized as fully as shown in table 3 and 6. This would probably mean more fuel consumption than anticipated but it should also be borne in mind that the systems, especially in alt. A and B, have considerable secondary energy capacity as the rated output of the Búrfell units corresponds to best turbine efficiency and the water flow in most years in much more than sufficient for rated capacity. The amount of secondary energy has not yet been estimated and, consequently, it is not considered in this report.

During 1962-63, the energy losses and power stations consumption in the Sog system has been 8-9%. It can be expected that these losses will decrease as the systems expand, but in order to be on the safe side it is here assumed that approx. 91% of produced energy for the general load in alt. A and B will be sold and approx. 95% of the energy produced for the aluminium smelter. In alt. C, the same figure, or 91% is used for the system in the South and approx. 93% for the system in the North.

Number of sold kW:s during the past years have been approx. 95% of produced kW:s. This figure is here used throughout for the general load in all alternatives and also for the smelter in alt. A and B.

Table 10 and 11 show the estimated power sales from the various stations after year 1967, when assuming these losses. It will be noted that the power sales to the existing fertilizer plant is credited to the Sog plants although a part of the corresponding production will actually come from the base load plants. It will also be noted that the power sales from the Laxá I and II plants is in alt. C assumed to be the same as in alt. A and B although a part of the corresponding production will actually come from the Laxá III plant, see table 6.

During 1964-1967 the power sales of the Sog and Laxá systems are estimated as follows:

Power Sales Sog 1964-1967.

Year	64	65	66	67
MW	76.5	80.6	84.9	89.9
GWh	368.0	389.0	410.0	437.0
GWh, off peak	99.0	76.5	58.5	36.0

Part of this energy is purchased from the Ellidaár stations. These purchases are reflected in the operation cost of the Sog system.

Power Sales Laxá 1964-1967.

Year	64	65	66	67
Laxá I & II, MW	11.4	11.4	11.4	11.4
Laxá I & II, GWh	62.0	65.0	68.0	70.0
Akureyri Thermal, MW	1.2	2.2	3.2	4.3
Akureyri Thermal, GWh	1.0	2.0	4.0	6.0

It will be noted that the fertilizer factory which requires some 100 GWh/year in off peak energy will not get this amount during 1965-67 unless the energy deficit is met with fuel in the thermal stations and/or secondary energy from the Sog stations.

IV. FINANCIAL STRUCTURE AND FINANCING.

a. Present Financial Structure.

The existing power system in Iceland may, in terms of ownership, be divided into the following three categories.

1) The Sog System and the Laxá System both of which are jointly owned by the State and the municipalities of Reykjavík and Akureyri, respectively. They are the two largest hydro-developments in the country, and they both include a high transmission link to the respective market centres in Reykjavík and Akureyri. All the power from these plants is sold wholesale to distribution companies.

2) The State Electrical Power Works which is completely State-owned. This is primarily a distribution system in charge of the electrification of the less populated parts of the country. The State Electrical Power Works own and operate several small hydro plants and a number of thermal diesel plants, but substantial power is also purchased from the Sog and Laxá hydro plants. The State Electrical Power Works sell power both wholesale to municipal distribution companies and retail through their own extensive distribution network.

3) Municipal electricity companies. There are a number of such companies all serving towns or small urban areas. Their main activity is the retail distribution of electricity, but some of them also generate electric power in their own plants.

The initial phase of the electrification of Iceland was characterized by the rise of numerous small municipally owned urban distribution companies each generating its own power. During the last two decades a process of integration has been taking place together with extensive electrification of rural areas. This has tended to concentrate the development of new power production in fewer hands. In the South-West the Sog Hydro Plants have become the main producer of power for a large integrated network which is being steadily extended. In the North Laxá supplies power to the second largest integrated network in the country. In other parts of the country, an increasing part of new power development has been in the hands of the State Electrical Power Works.

b. Further Integration of the Power System.

As the integration of the system progresses, it becomes more important to unify power production and overall planning under a single agency. The Sog System has to a certain extent become such an agency for the South-West of the country and the Laxá System for a part of the North. When the next major stage in power development is undertaken it becomes important to decide how it should be fitted into the existing structure of the industry.

In view of the financially strong position of the Sog System it is particularly important to integrate new plants with the Sog System. It would also be economically beneficial to integrate the Laxá System into the same company, especially if or when a transmission line is built to link the two together.

The organizational structure now being favoured by the Icelandic Government is to amalgamate the Sog and Laxá Developments into a new entity, the National Power Company, which would be charged with the responsibility for power production in order to meet the requirements of those parts of the country which have sizeable integrated networks. Initially this would only apply to the South-West and a part of the North.

The National Power Company would be primarily organized to facilitate the large-scale development of the cheap hydro-electric power resources in Iceland both for industrial use and for distribution to the main centres of consumption in the country.

c. The Equity Situation.

By overtaking the assets of the Sog and Laxá System The National Power Company would start with a favourable debt-equity ratio. In order to ascertain the initial equity position of the existing system, all the assets of the Sog and Laxá have been revalued to end 1963 prices and depreciated to that date. By this method, which is further explained elsewhere, the net equity of existing system was found to be $ 9.16 million and total debt $ 13.95 giving an equity ratio of 40%.

If a large-scale power development, such as the Búrfell project, is to be undertaken new equity will be important in order to strengthen the financial position of the system. No decision has been taken so far on the actual provision of such equity by the Government. Certain assumptions have, however, been made for each of the three alternatives. These assumptions, which are further detailed below have to be considered the most realistic appraisal obtainable at this stage of the financial commitment likely to be made by the Icelandic Government and the Althing.

Alternative A. Here is assumed that new equity amounting to $ 5.0 million is provided during the initial stage, i.e. up to the end of 1967. Of this equity $ 800 thousand represents expenditure on the design and preparation of the Búrfell Project up to the end of 1963. The remainder would have to be available in cash over the years 1964-1967. The following breakdown by year has been assumed:

	$
before 1964	800 000
in 1964	850 000
in 1965	750 000
in 1966	1 300 000
in 1967	1 300 000
	5 000 000

For the initial project up to the end of 1967 this would represent close to 20% of total investment. At end of 1967 the total equity of the existing and new systems would be $ 16.87 million giving an equity ratio of just over 32%.

Alternative B. It is assumed that new equity in this case will amount to $ 7.5 million. Because of the larger investment involved a larger equity is needed than in alternative A, and it is considered realistic to assume that the Althing will be willing to appropriate more new finance in this case because of the regional planning benefits involved. As in case A, $ 800 thousand of this new equity is represented by the cost of the Búrfell Project to date. It is assumed that this equity will be available in the following years:

	$
Before 1964	800 000
in 1964	850 000
in 1965	1 250 000
in 1966	2 300 000
in 1967	2 300 000
	7 500 000

This new equity would represent 22% of the total investment in the project up to the start of operations at the end of 1967. At that point total equity of the existing and new systems would be $ 19.3 million, which represents an equity ratio of close to 33%.

Alternative C. As this alternative involves smaller investments in the initial period there is not the need for a large increase in the equity of the system. Neither would it be realistic to assume that the Government and the Althing would be willing to make any new significant appropriations for this purpose. Alternative C represents no departure from power development policy in the past, when new equity from the State has not been forthcoming in connection with new project by the Sog or Laxá System. Here it is, neverthless, assumed that the State will provide as new equity to a sum equal to the cost at Hveragerdi until the end of 1963, but this includes use of several boreholes, which were developed for possible use by a geothermal power plant. This represents new equity to the amount of $ 840 thousand.

d. Sources of loan funds.

It has been assumed throughout the present study that borrowing abroad would amount to up to 80% of the total investment and a 6% interest rate has been allowed on all loans with an amortization period close to IBRD practice.

At this stage it is only possible to make a very tentative appraisal of the possibilities of raising funds from other sources than the IBRD. Some preliminary inquiries and studies have been made and the following sources of credit are considered most promising for this project.

1) An approach to a Swiss bank has indicated that it should be possible to raise an Icelandic loan on the Swiss capital market against a power contract with a Swiss Company such as Swiss Aluminium Ltd. The amount could be $ 3-4 million and the time around 15 years. Discussions on this are, of course, only preliminary so far pending further results from discussions with the aluminium companies and the IBRD.

2) It is also considered reasonable to expect that a similar loan may be raised in New York in cooperation with American Metal Climax, but no actual negotiations have yet taken place.

3) A preliminary approach has been made to the Export-Import Bank in Washington regarding financing of procurements for the Búrfell Project in the United States. It is considered likely that procurements in the U.S. would on a competitive basis amount to not less than $ 3-5 million which might then be financed by a loan from the Export-Import Bank.

This considerations lead to the conclusion that it would not be unreasonable to assume that loans to the amount of $ 9-12 million would be obtainable for the Búrfell Project from other sources than the IBRD.

V. ECONOMIC COMPARISON OF ALTERNATIVE DEVELOPMENTS

a. Assumptions.

The three main alternatives to be compared are as follows:

Alternative A: Búrfell power plant with an aluminium smelter in the South and a transmission line to the North.

Alternative B: The same except that the smelter be located in the North.

Alternative C: The development of three smaller power plants in the South and North. No interconnection between the South and North.

A detailed description of each alternative is to be found in preceding chapters and in tables 1- 11.

Economic comparison of the alternatives is made by calculating present worth and yield of total investment on one hand and assumed equity on the other. Calculations of present worth are based on the year 1967 as the initial projects in each alternative are assumed to be completed before the end of that year. The main assumptions for the calculation are the following.

1) Life of Plants.	Years
Hydro plants	40
Transmission lines	40
Reserve stations (gas turbines)	40
Geothermal plants	20
Diesel stations (peaking)	20

2) Income: Total income for each alternative is derived from forecasts of total sales of electricity as shown in chapter II and table 1 of this report. Existing hydro plants are assumed to produce at their practical capacity and the remaining load is allocated to the projected stations.

The prices of power and energy used to compute income series are the following:

To power distributing companies:

$ 22.70 per KW of peak demand
plus 1.37 mills per KWh.

To aluminium smelter:

2.5, 3.0 and 3.5 mills per KWh respectively during the first 25 years and 3.0 in all cases for the remaining 15 years of the life of Búrfell I.

To fertilizer plant:

Primary load: same as to power distributing companies.
Off-peak energy: 1.37 mills per KWh.

Computation of income for each plant or stage of plant is shown in table 12 for alternatives A and B (identical) and table 13 for alternative C. It should be noted that alternatives A and B are designed for sale of off-peak energy while peaking capacity is provided for in alternative C.

3) Operational Expenses and Construction Costs: Estimates for these are shown in tables 7-9 which are further explained in chapter III above.

The basic information for each alternative is to be found in tables 14-16 entitled "Net receipts from operations" where a breakdown is given of operational expenses and income for each project during its assumed lifetime. Cost of fuel for thermal generation is also included and an annual lump-sum payment to the existing Ellidaár Thermal station for peaking capacity after 1973 in alternative C.

b. Yield of Total Investment.

Calculations of yield and present worth of total investment are shown in tables 17-19. Estimates of construction cost without interest during construction are given in Chapter III and tables 7- 9. All figures are without import duties. The calculations are based on sales to the smelter in alternatives A and B at the lowest assumed price i.e. 2.5 mills per KWh. Estimates based on sales at 3.0 and 3.5 mills are made by computing separately present worth of additional revenue resulting from the higher prices, i.e. 25 year series of $ 0.22 and $ 0.45 million respectively and adding to totals in tables 17 and 18. These calculations are shown in table 26. The results are tabulated below.

Yield of Total Investment.

	Present worth 6% Millions of dollars	Present worth 8% Millions of dollars	Yield % p. a.
Alternative A.			
Price to smelter 2, 5 mills	18.22	3.52	8, 7
" " " 3.0 "	21.03	5.87	9.1
" " " 3.5 "	23.97	8.32	9.4
Alternative B.			
Price to smelter 2.5 mills	13.80	- 0.98	7.8
" " " 3.0 "	16.61	1.37	8.2
" " " 3.5 "	19.55	3.82	8.5
Alternative C.	0.70	- 3.04	6.3

On account of yield A and B both seem to be superior to C even at the lowest price to smelter. A is also superior to B and the difference in present worth of approximately $ 4.5 million is a measure of the financial burden resulting from locating the smelter in North.

No indirect benefits or costs resulting from larger power plants and an aluminium industry are included nor are such effects of location of smelter in North included. These are discussed in a seperate report.

c. Return to Equity.

It is assumed that new equity will be provided by the government in cash for the initial projects of each alternative. This includes payment of preliminary expenses.

	New equity
Alternative A	$ 5.00 million
Alternative B	$ 7.50 "
Alternative C	$ 0.84 "

In alternatives A and B the remaining investment in the initial projects is assumed to be financed by loans and projects after that financed 80 per cent by loans and 20 per cent by equity from the surplus generated by the existing system. In alternative C $ 1.06 million of equity for the first project is assumed to be provided out of the surplus of the existing system. A total of $ 1.9 million or approximately 20 per cent equity will thus be provided. Later projects are assumed to be financed as in A and B. Cash deficiencies of each alternative during load-building are assumed to be covered with funds from the existing system which is equivalent to equity for the alternatives. According to projections of financial operating results for the integrated systems funds will be available for this purpose in all alternatives. Injection of further cash from outside is, therefore, not necessary.

Estimates of investment outlay include interest on loans during construction. Assumptions for the financing of each project are shown in detail in tables 23- 25. The sources of loan funds are further discussed in chapter IV.

Interest rate on loans is assumed to be 6 per cent per annum in all instances and payment of interest and amortization by equal annual instalments after a grace period. Loan period is assumed to be as follows:

	Grace period years	Repayment period years	Total loan period years
Hydro plants	5	20	25
Transmission lines	5	20	25
Reserve stations (gas turbine)	3	17	20
Geothermal plants	3	17	20
Diesel station (peaking)	3	17	20

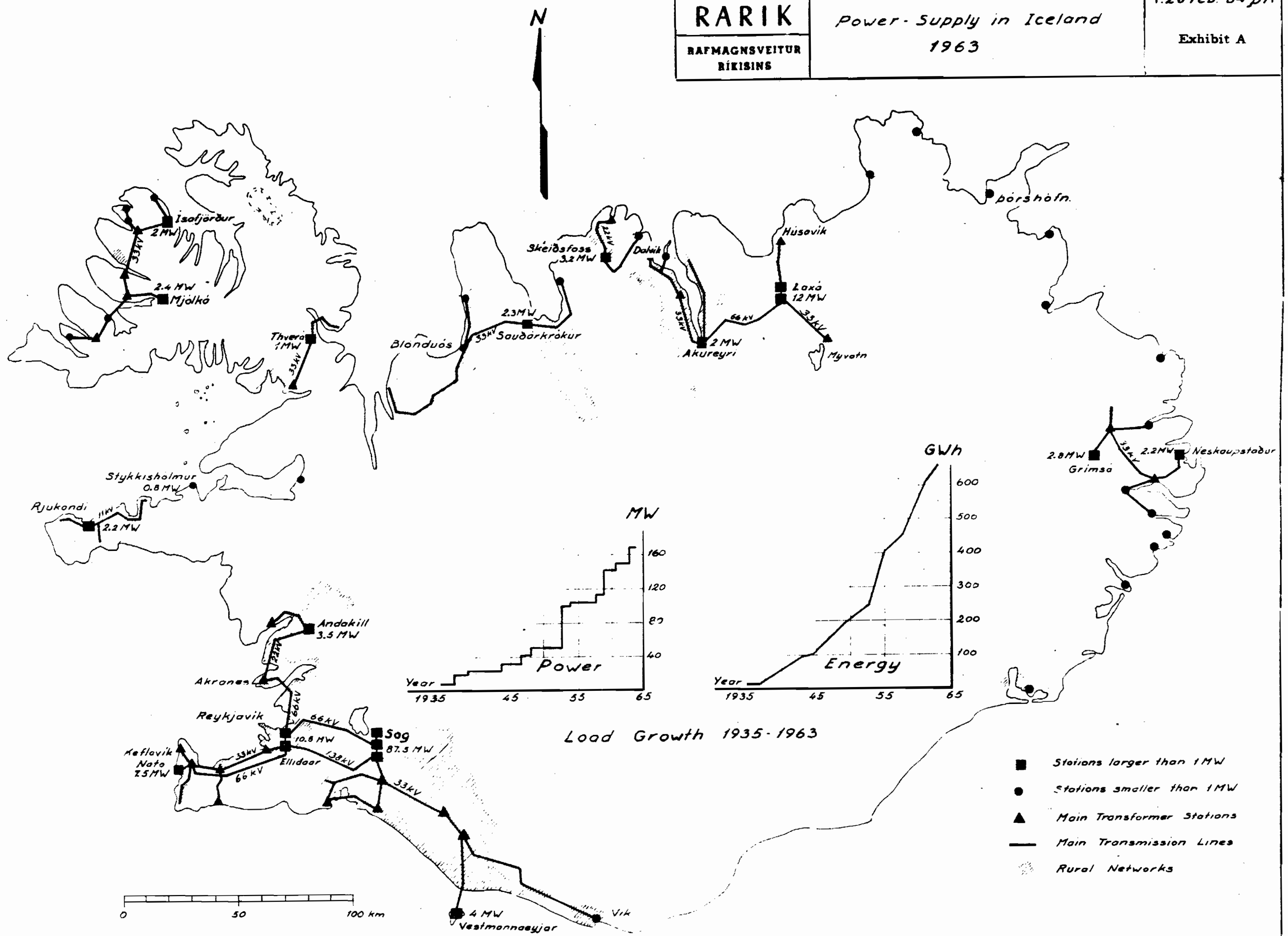
Calculations of the yield to equity are shown in tables 20-22. They are based on the lowest assumed price to the smelter which is 2.5 mills per KWh. Calculation for prices of 3.0 and 3.5 mills are made separarely as shown in table 26. The results are tabulated below.

Yield of Assumed Equity.

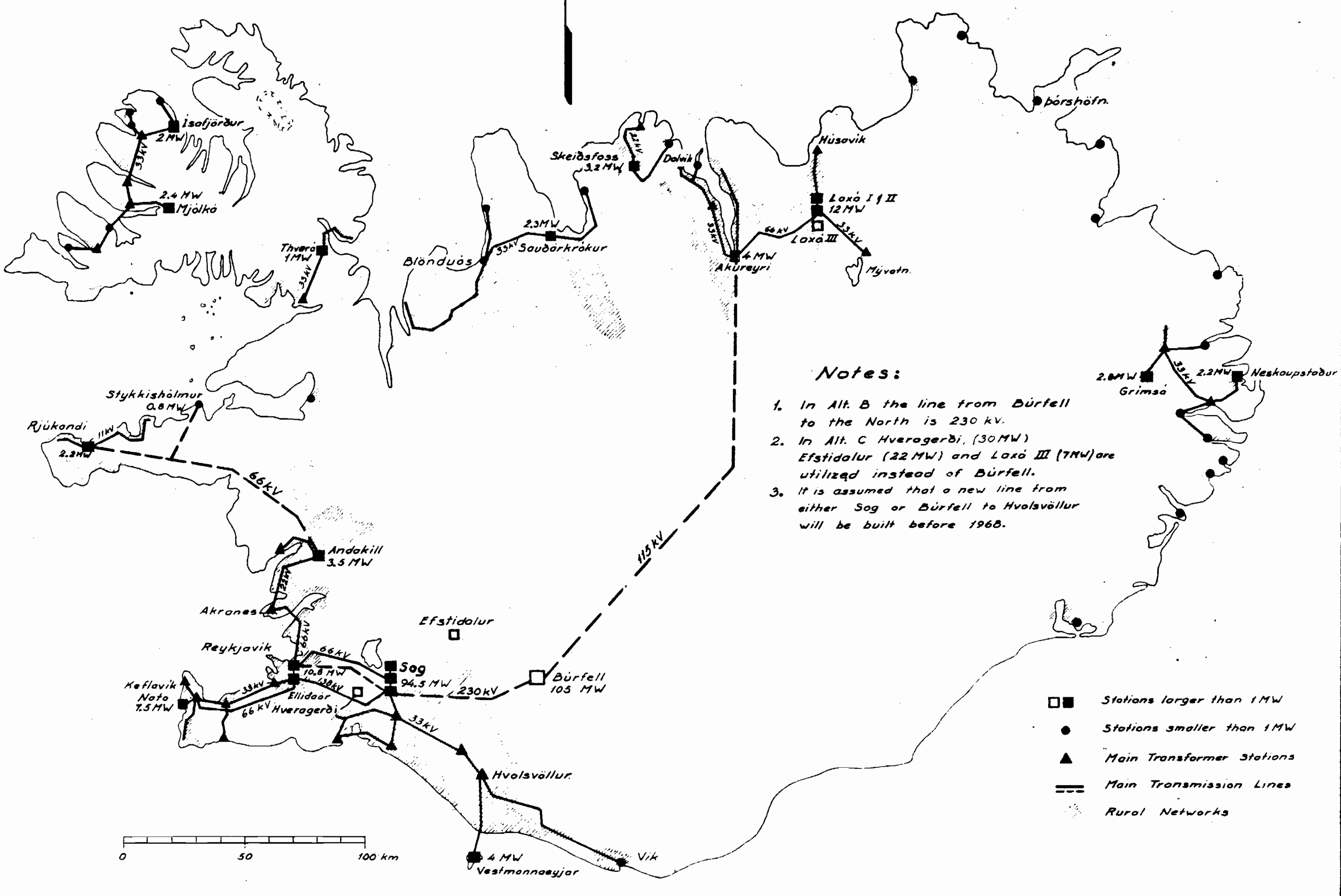
	Present Worth at 8% p. a. Millions of Dollars	Yield % p. a.
Alternative A		
Price to smelter 2.5 mills	8.31	11.7
" " " 3.0 "	10.66	12.8
" " " 3.5 "	13.11	13.8
Alternative B		
Price to smelter 2.5 mills	3.85	9.4
" " " 3.0 "	6.20	10.3
" " " 3.5 "	8.65	11.1
Alternative C	- 1.24	6.4

Again with respect of yield to assumed equity A and B are both superior to C and A superior to B. It should however be noticed that different amounts of equity are involved, the highest amount being in alternative B and lowest in alternative C, which is also the smallest of the three.

RARIK RAFMAGNSVEITUR RÍKISINS	Power-Supply in Iceland 1963	1.26 feb. '64 βK Exhibit A



RARIK RAFMAGNSVEITUR RÍKISINS	Alternative A The Búrfell Project in Iceland 1968	T. 26 feb. '64 ÞK Exhibit B



Notes:

1. In Alt. B the line from Búrfell to the North is 230 kV.
2. In Alt. C Hveragerði, (30 MW) Efstidalur (22 MW) and Laxá III (7 MW) are utilized instead of Búrfell.
3. It is assumed that a new line from either Sog or Búrfell to Hvolsvöllur will be built before 1968.

Table 1.

Load Forecasts
for Southwest and North (Dalvik-Husavik) Iceland

Year	Ordinary Load in Southwest		Ordinary Load in North		Nato Load		Existing Fertilizer			Total Load for Alt. C		New Fertilizer or Space Heating			Aluminum Smelter		Total Load for Alt. A&B	
	GWh	MW	GWh	MW	GWh	MW	GWh	GWh off-peak	MW on peak	GWh	MW	GWh	GWh off-peak	MW on peak	GWh	MW	GWh	MW
64	358	77.5	68	13.5	50	6.5	29	110	3.5	615	101	-	-	-	-	-	101	615
1965	380	82.5	72	14.5	52	6.5	29	110	3.5	643	107	-	-	-	-	-	107	643
66	403	87.5	78	15.5	53	6.5	29	110	3.5	673	113	-	-	-	-	-	113	673
67	428	93	82	16.5	59	6.5	29	110	3.5	708	119.5	-	-	-	-	-	119.5	708
68	458	99.5	87	18	69	10	29	110	3.5	753	131	-	-	-	55	470	186	1223
69	490	106	93	19	73	11	29	110	3.5	795	139.5	29	110	3.5	55	470	198	1404
1970	524	114	99	20	78	12	29	110	3.5	840	149.5	29	110	3.5	55	470	208	1449
71	561	121.5	105	22	82	12.5	29	110	3.5	887	159.5	29	110	3.5	55	470	218	1496
72	600	130	111	23	85	13	29	110	3.5	935	169.5	29	110	3.5	55	470	228	1544
73	642	139	119	25	88	13	29	110	3.5	988	180.5	29	110	3.5	55	470	239	1597
74	687	149	127	26	94	13	29	110	3.5	1047	191.5	29	110	3.5	55	470	250	1656
1975	735	159	134	28	97	13	29	110	3.5	1105	203.5	29	110	3.5	55	470	262	1714
76	786	171	142	29	97	13	29	110	3.5	1164	216.5	58	220	6.5	55	470	278	1912
77	841	183	150	31	97	13	29	110	3.5	1227	230.5	58	220	6.5	55	470	292	1975
78	900	196	159	33	97	13	29	110	3.5	1295	245.5	58	220	6.5	55	470	307	2043
79	963	209	169	35	97	13	29	110	3.5	1368	260.5	58	220	6.5	55	470	322	2116
1980	1030	224	178	37	97	13	29	110	3.5	1444	277.5	58	220	6.5	55	470	339	2192
81	1102	240	189	39	97	13	29	110	3.5	1527	295.5	58	220	6.5	55	470	357	2275
82	1179	256	201	42	97	13	29	110	3.5	1616	314.5	58	220	6.5	55	470	376	2364

Note 1. All figures refer to production and thus include losses.

TABLE 2

Alternative A

Power Developments

Year	Existing Hydro MW	Thermal Peak MW	Búrfell MW	Total Producing Stat. MW	General Load South MW	General Load North MW	General Load Total MW	Smelter Load MW	Total Load MW	Reserve Power Exist.St. MW	Reserve Power New St. MW	Reserve Power Total÷Peak MW
68	111	-	105	216	113	18	131	55	186	39	-	39
69	111	-	105	216	124	19	143	55	198	39	-	39
1970	111	-	105	216	133	20	153	55	208	39	20	59
71	111	2	105	218	141	22	163	55	218	39	20	57
72	111	12	105	228	150	23	173	55	228	39	40	67
73	111	-	140	251	159	25	184	55	239	39	40	79
74	111	-	140	251	169	26	195	55	250	39	40	79
1975	111	11	140	262	179	28	207	55	262	39	40	68
76	111	-	175	286	194	29	223	55	278	39	40	79
77	111	6	175	285	206	31	237	55	292	39	40	73
78	111	-	210	321	219	33	252	55	307	39	40	79
79	111	1	210	322	232	35	267	55	322	39	40	78

TABLE 3

Alternative A and B

Power Production

Year	Total Load		Product. Anda-kíll, Rjúkandi		Product. Sog and Laxá		Product. Búrfell		Product. Thermal		Total Product.	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
68	186	1223	4.5	32	106.5	585	75	606	-	-	186	1223
69	198	1404	4.5	32	106.5	585	87	787	-	-	198	1404
1970	208	1449	4.5	32	106.5	590	97	827	-	-	208	1449
71	218	1496	4.5	32	106.5	590	105	850	2	1	218	1473
72	228	1544	4.5	32	106.5	595	105	850	12	13	228	1490
73	239	1597	4.5	32	106.5	595	128	970	-	-	239	1597
74	250	1656	4.5	32	106.5	595	139	1029	-	-	250	1656
1975	262	1714	4.5	32	106.5	595	140	1076	11	11	262	1714
76	278	1912	4.5	32	106.5	595	167	1285	-	-	278	1912
77	292	1975	4.5	32	106.5	595	175	1343	6	5	292	1975
78	307	2043	4.5	32	106.5	595	196	1416	-	-	307	2043
79	322	2116	4.5	32	106.5	595	210	1489	1	0	322	2116

Note: In years 71-72 off-peak load,(fertilizer and/or space heating) must be reduced, unless it can be met by secondary energy production, which however is not considered here.

TABLE 4

Alternative B

Power Developments

Year	Existing Hydro MW	Thermal Peak MW	Búr-fell MW	Total Producing Stat. MW	General Load South MW	General Load North MW	General Load Total MW	Smelter Load MW	Total Load MW	Reserve Power Exist.St. MW	Reserve Power New St. MW	Reserve Power Total:Peak MW
68	111	-	105	216	113	18	131	55	186	39	50	89
69	111	-	105	216	124	19	143	55	198	39	50	89
1970	111	-	105	216	133	20	153	55	208	39	50	89
71	111	2	105	218	141	22	163	55	218	39	50	87
72	111	12	105	228	150	23	173	55	228	39	50	77
73	111	-	140	251	159	25	184	55	239	39	50	89
74	111	-	140	251	169	26	195	55	250	39	50	89
1975	111	11	140	262	179	28	207	55	262	39	50	78
76	111	-	175	286	194	29	223	55	278	39	50	89
77	111	6	175	285	206	31	237	55	292	39	50	83
78	111	-	210	321	219	33	252	55	307	39	50	89
79	111	1	210	322	232	35	267	55	322	39	50	88

TABLE 5

Alternative C

Power Developments

Southwest-Area

Year	Existing Hydro MW	Thermal Peak MW	Hvera-gerdi MW	Efsti-dalur MW	Total Pro-ducing Stat. MW	Total Load MW	Reserve Power: Exist. St. MW	Reserve Power: Total ÷ Peak MW
68	99	-	30	-	129	113	35	35
69	99	-	30	-	129	121	35	35
1970	99	-	30	-	129	129	35	35
71	99	9	30	-	138	138	35	26
72	99	-	30	22	151	147	35	35
73	99	5	30	22	156	156	35	30
74	99	14	30	22	165	165	35	21

North-Area from Dalvík to Húsavík

Year	Existing Hydro MW	Thermal Peak MW	Laxá III MW	Total Pro-ducing Stat. MW	Total Load MW	Reserve Power: Exist. St. MW	Reserve Power: New St. MW	Reserve Power: Total ÷ Peak MW
68	12	-	7	19	18	4	-	4
69	12	-	7	19	19	4	-	4
1970	12	1	7	20	20	4	7	10
71	12	3	7	22	22	4	7	8
72	12	4	7	23	23	4	7	7
73	12	6	7	25	25	4	7	5
74	12	7	7	26	26	4	7	4

Note: Total load in SW here excludes increased fertilizer production and/or space heating.

TABLE 6

Alternative C

Power Production

Southwest-Area

Year	Total Load		Product. Anda-kíll, Rjúkandi		Product. Sog		Product. Hveragerdi		Product. Efstidalur		Product. Thermal		Total Product	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
68	113	666	4.5	32	94.5	510	14	124	-	-	-	-	113	666
69	121	702	4.5	32	94.5	510	22	160	-	-	-	-	121	702
1970	129	741	4.5	32	94.5	510	30	199	-	-	-	-	129	741
71	138	782	4.5	32	94.5	510	30	233	-	-	9	7	132	782
72	147	824	4.5	32	94.5	510	30	233	18	49	-	-	147	824
73	156	869	4.5	32	94.5	510	30	233	22	91	5	3	156	869
74	165	920	4.5	32	94.5	510	30	233	22	134	14	11	165	920

North-Area from Dalvík to Húsavík

Year	Total Load		Production Laxa I & II		Production Laxa III		Production Thermal		Total Production	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
68	18	87	12	58	6	29	-	-	18	87
69	19	93	12	59	7	34	-	-	19	93
1970	20	99	12	62	7	36	1	1	20	99
71	22	105	12	65	7	37.5	3	2.5	22	105
72	23	111	12	67	7	40	4	4	23	111
73	25	119	12	70	7	41.5	6	7.5	25	119
74	26	127	12	74	7	43	7	10	26	127

Note 1: Load figures for SW here exclude increased fertilizer production and/or space heating.

Note 2: Secondary energy production is not considered here.

TABLE 7

Alternative A

Construction Costs exclusive Import Duties and

Taxes and Interest during Construction.

Operation and Maintenance Costs and Fuel Costs.

In Millions of U.S. $

Year	Construction				Operation and Maintenance				Fuel		
	Búrfell and Transm. Rvk.	Transm. to North	Gas Turbines	Total Cost	Búrfell and Transm. Rvk.	Transm. to North	Gas Turbines	Total Cost	Peak Cost	Reserve Cost	Total Cost
Before 64	0.80	-	-	0.80	-	-	-	-	-	-	-
64	0.85	-	-	0.85	-	-	-	-	-	-	-
1965	6.62	-	-	6.62	-	-	-	-	-	-	-
66	9.48	0.80	-	10.28	-	-	-	-	-	-	-
67	7.29	1.25	-	8.54	-	-	-	-	-	-	-
68	-	-	0.40	0.40	0.30	0.02	-	0.32	-	0.05	0.05
69	-	-	1.40	1.40	-	-	-	-	-	0.05	0.05
1970	0.15	-	0.40	0.55	-	-	0.02	0.02	-	0.08	0.08
71	2.31	-	1.40	3.71	-	-	-	-	0.01	0.08	0.09
72	1.53	-	-	1.53	-	-	0.02	0.02	0.11	0.12	0.23
73	0.16	-	-	0.16	0.13	-	-	0.13	-	0.12	0.12
74	3.57	-	-	3.57	-	-	-	-	-	0.12	0.12
1975	3.23	-	-	3.23	-	-	-	-	0.10	0.12	0.22
76	0.54	-	-	0.54	0.09	-	-	0.09	-	0.12	0.12
77	0.88	-	-	0.88	-	-	-	-	0.05	0.12	0.17
78	-	-	-	-	0.07	-	-	0.07	0	0.12	0.12

TABLE 8

Alternative B

Construction Costs exclusive Import Duties and
Taxes and Interest during Construction.
Operation and Maintenance Costs and Fuel Costs.
In Millions of U.S. $

Year	Construction				Operation and Maintenance				Fuel		
	Búrfell and Transm. Rvk.	Transm. to North	Gas Turbines	Total Cost	Búrfell and Transm. Rvk.	Transm. to North	Gas Turbines	Total Cost	Peak Cost	Reserve Cost	Total Cost
Before 64	0.80	-	-	0.80	-	-	-	-	-	-	-
64	0.85	-	-	0.85	-	-	-	-	-	-	-
1965	6.62	-	-	6.62	-	-	-	-	-	-	-
66	9.48	2.00	0.60	12.08	-	-	-	-	-	-	-
67	7.18	3.00	3.40	13.58	-	-	-	-	-	-	-
68	-	-	-	-	0.30	0.05	0.04	0.39	-	0.05	0.05
69	-	-	-	-	-	-	-	-	-	0.05	0.05
1970	0.15	-	-	0.15	-	-	-	-	-	0.08	0.08
71	2.31	-	-	2.31	-	-	-	-	0.01	0.08	0.09
72	1.53	-	-	1.53	-	-	-	-	0.11	0.12	0.23
73	0.16	-	-	0.16	0.13	-	-	0.13	-	0.12	0.12
74	3.57	-	-	3.57	-	-	-	-	-	0.12	0.12
1975	3.23	-	-	3.23	-	-	-	-	0.10	0.12	0.22
76	0.54	-	-	0.54	0.09	-	-	0.09	-	0.12	0.12
77	0.88	-	-	0.88	-	-	-	-	0.05	0.12	0.17
78	-	-	-	-	0.07	-	-	0.07	0	0.12	0.12

TABLE 9

Alternative C

Construction Costs exclusive Import Duties and Taxes and Interest during Construction. Operation and Maintenance Costs and Fuel Costs.

In Millions of U.S. $

Year	Construction					Operation and Maintenance					Fuel		
	Hvera-gerdi	Efsti-dalur	Laxá III	Akureyri Thermal	Total Cost	Hvera-gerdi	Efsti-dalur	Laxá III	Akureyri Thermal	Total Cost	Southern Thermal	Akureyri Thermal	Total Cost
Before 64	0.64	0.08	0.12	-	0.84	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-	-	-	-	-	-
1965	0.35	-	0.44	-	0.79	-	-	-	-	-	-	-	-
66	2.76	-	0.93	-	3.69	-	-	-	-	-	-	-	-
67	2.69	-	1.53	-	4.22	-	-	-	-	-	-	-	-
68	-	-	-	0.14	0.14	0.29	-	0.04	-	0.33	-	-	-
69	-	1.30	-	0.70	2.00	-	-	-	-	-	-	-	-
1970	-	2.60	-	-	2.60	-	-	-	0.02	0.02	-	0.01	0.01
71	-	2.47	-	-	2.47	-	-	-	-	-	0.06	0.03	0.09
72	-	-	-	-	-	-	0.09	-	-	0.09	-	0.04	0.04
73	-	-	-	-	-	-	-	-	-	-	0.03	0.08	0.11
74	-	-	-	-	-	-	-	-	-	-	0.10	0.10	0.20

Note: Hveragerdi includes a new transmission from Reykjavik to Sog and Efstidalur a transmission from there to Sog.

TABLE 10

Alternative A and B

Power Sales

Year	Sog General Load MW	Sog General Load GWh	Sog General Load GWh Off-peak	Laxá General Load MW	Laxá General Load GWh	Búrfell General Load MW	Búrfell General Load GWh	Búrfell General Load GWh Off-peak	Búrfell Smelter MW	Búrfell Smelter GWh	Thermal Stations General Load MW	Thermal Stations General Load GWh
68	90	364	100	11.5	68	19	124	-	52	445	-	-
69	90	364	100	11.5	68	30.5	188	100	52	445	-	-
1970	90	364	100	11.5	73	40	225	100	52	445	-	-
71	90	364	100	11.5	73	47.5	267	79	52	445	2	1
72	90	364	100	11.5	75	47.5	295	51	52	445	11.5	12
73	90	364	100	11.5	75	69.5	355	100	52	445	-	-
74	90	364	100	11.5	75	80	408	100	52	445	-	-
1975	90	364	100	11.5	75	81	451	100	52	445	10.5	10
76	90	364	100	11.5	75	106.5	541	200	52	445	-	-
77	90	364	100	11.5	75	114	594	200	52	445	5.5	4
78	90	364	100	11.5	75	134	660	200	52	445	-	-
79	90	364	100	11.5	75	146	726	200	52	445	1	0

Note: In years 71-72 off peak load (fertilizer and/or space heating) must be reduced, unless it can be met by secondary energy production, which however is not considered here.

TABLE 11

Alternative C

Power Sales

Southwest-Area

Year	Sog MW	Sog GWh	Sog GWh off-peak	Hveragerdi MW	Hveragerdi GWh	Efstidalur MW	Efstidalur GWh	Thermal Stations MW	Thermal Stations GWh
68	90	364	100	13.5	113	-	-	-	-
69	90	364	100	21	146	-	-	-	-
1970	90	364	100	28.5	181	-	-	-	-
71	90	364	100	28.5	212	-	-	8.5	6.5
72	90	364	100	28.5	212	17	45	-	-
73	90	364	100	28.5	212	21	83	4.5	2.5
74	90	364	100	28.5	212	21	122	13.5	10

North-Area from Dalvík to Húsavík

Year	Laxá I and II MW	Laxá I and II GWh	Laxá III MW	Laxá III GWh	Thermal Stations MW	Thermal Stations GWh
68	11.5	68	5.5	13	-	-
69	11.5	68	6.5	15.5	-	-
1970	11.5	73	6.5	17.5	1	1
71	11.5	73	6.5	22.5	3	2.5
72	11.5	75	6.5	23.5	3.5	3.5
73	11.5	75	6.5	28.5	5.5	7
74	11.5	75	6.5	34	6.5	9.5

Note: Secondary energy production is not considered here.

Projects completed
in 1967 and later.

Table 12.

ALTERNATIVE A AND B.

REVENUE FROM POWER SALES EXCLUDING SMELTER

(In Thousands of Dollars)

Year	Thermal Stations Load MW	Thermal Stations Load GWh	Thermal Stations Revenue MW	Thermal Stations Revenue GWh	Thermal Stations Total	Búrfell I Load MW	Búrfell I Load GWh	Búrfell I Revenue MW	Búrfell I Revenue GWh	Búrfell I Total	Búrfell II Load MW	Búrfell II Load GWh	Búrfell II Revenue MW	Búrfell II Revenue GWh	Búrfell II Total	Búrfell III Load MW	Búrfell III Load GWh	Búrfell III Revenue MW	Búrfell III Revenue GWh	Búrfell III Total	Búrfell IV Load MW	Búrfell IV Load GWh	Búrfell IV Revenue MW	Búrfell IV Revenue GWh	Búrfell IV Total	Fertilizer Hydrogen Load Gwh	Fertilizer Hydrogen Revenue GWh
1968						19.0	124	431	170	601																100	137
1969						30.5	188	692	258	950																100	137
1970						40.0	225	908	308	1,216																100	137
1971	2,0	1	45	1	46	47.5	267	1,078	366	1,444																79	108
1972	11,5	12	261	16	277	47.5	295	1,078	404	1,482																51	70
1973						47.5	295	1,078	404	1,482	22.0	60	499	82	581											100	137
1974						47.5	295	1,078	404	1,482	32.5	113	738	155	893											100	137
1975	10.5	10	238	14	252	47.5	295	1,078	404	1,482	33.5	156	760	214	974											100	137
1976						47.5	295	1,078	404	1,482	33.5	156	760	214	974	25,5	90	579	123	702						200	274
1977	5.5	4	125	5	130	47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945						200	274
1978						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	20.0	66	454	90	544	200	274
1979	1.0	0	23	0	23	47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1980						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1981						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1982						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1983						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1984						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1985						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1986						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1987						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1988						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1989						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1990						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1991						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1992						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1993						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1994						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1995						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1996						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1997						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1998						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
1999						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2000						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2001						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2002						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2003						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2004						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2005						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2006						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2007						47.5	295	1,078	404	1,482	33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2008											33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2009											33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2010											33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2011											33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2012											33.5	156	760	214	974	33.0	143	749	196	945	32.0	132	726	181	907	200	274
2013																33.0	143	749	196	945	32.0	132	726	181	907	200	274
2014																33.0	143	749	196	945	32.0	132	726	181	907	200	274
2015																33.0	143	749	196	945	32.0	132	726	181	907	200	274
2016																					32.0	132	726	181	907	200	274
2017																					32.0	132	726	181	907	200	274

Projects completed
in 1967 and later.

Table 13.

ALTERNATIVE C.

REVENUE FROM POWER SALES

(In Millions of Dollars)

Year	Thermal Stations Load MW	Thermal Stations Load GWh	Thermal Stations Revenue MW	Thermal Stations Revenue GWh	Thermal Stations Total	Hveragerdi Load MW	Hveragerdi Load GWh	Hveragerdi Revenue MW	Hveragerdi Revenue GWh	Hveragerdi Total	Efstidalur Load MW	Efstidalur Load GWh	Efstidalur Revenue MW	Efstidalur Revenue GWh	Efstidalur Total	Laxá III Load MW	Laxá III Load GWh	Laxá III Revenue MW	Laxá III Revenue GWh	Laxá III Total
1968						13.5	113	0.31	0.15	0.46						5.5	13	0.12	0.02	0.14
1969						21.0	146	0.48	0.20	0.68						6.5	18.5	0.15	0.03	0.18
1970	1.0	1.0	0.02	0.00	0.02	28.5	181	0.65	0.25	0.90						6.5	17.5	0.15	0.02	0.17
1971	11.5	9.0	0.26	0.01	0.27	28.5	212	0.65	0.29	0.94						6.5	22.5	0.15	0.03	0.18
1972	3.5	3.5	0.08	0.00	0.08	28.5	212	0.65	0.29	0.94	17.0	45	0.39	0.06	0.45	6.5	23.5	0.15	0.03	0.18
1973	10.0	9.5	0.23	0.01	0.24	28.5	212	0.65	0.29	0.94	21.0	83	0.48	0.11	0.59	6.5	28.5	0.15	0.04	0.19
1974	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1975	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1976	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1977	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.06	0.20
1978	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1979	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1980	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1981	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1982	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1983	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1984	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1985	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1986	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1987	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1988	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1989	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1990	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1991	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1992	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1993	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1994	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1995	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1996	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1997	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1998	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
1999	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2000	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2001	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2002	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2003	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2004	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2005	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2006	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2007	20.0	19.5	0.45	0.03	0.48	28.5	212	0.65	0.29	0.94	21.0	122	0.48	0.17	0.65	6.5	34	0.15	0.05	0.20
2008	20.0	19.5	0.45	0.03	0.48						21.0	122	0.48	0.17	0.65					
2009	20.0	19.5	0.45	0.03	0.48						21.0	122	0.48	0.17	0.65					
2010											21.0	122	0.48	0.17	0.65					
2011											21.0	122	0.48	0.17	0.65					

Projects completed
in 1967 and later

Table 14.

ALTERNATIVE A.

Net Receipts from Operations.

(In Millions of Dollars).

Year	Operation & Maintenance: Reserve Station (1)	Operation & Maintenance: North-South H.T.Line (2)	Operation & Maintenance: Búrfell I 105 MW (3)	Operation & Maintenance: Búrfell II 35 MW (4)	Operation & Maintenance: Búrfell III 35 MW (5)	Operation & Maintenance: Búrfell IV 35 MW (6)	Total O & M (7)	Fuel for Thermal Stations (8)	Income: General Load: Thermal Stations (9)	Income: General Load: Búrfell I (10)	Income: General Load: Búrfell II (11)	Income: General Load: Búrfell III (12)	Income: General Load: Búrfell IV (13)	Income: Total G.L. (14)	Income: Smelter Búrfell I (15)	Income: Secondary Load (16)	Income: Total Income (14+15+16) (17)	Operational Cost Total (7+8) (18)	Net Receipts from Operations (17-18) (19)
1968		0.02	0.30				0.32	0.05		0.60				0.60	1.11	0.14	1.85	0.37	1.48
1969		0.02	0.30				0.32	0.05		0.95				0.95	1.11	0.14	2.20	0.37	1.83
1970	0.02	0.02	0.30				0.34	0.08		1.22				1.22	1.11	0.14	2.47	0.42	2.05
1971	0.02	0.02	0.30				0.34	0.09	0.05	1.44				1.49	1.11	0.11	2.71	0.43	2.28
1972	0.04	0.02	0.30				0.36	0.23	0.28	1.48				1.76	1.11	0.07	2.94	0.59	2.35
1973	0.04	0.02	0.30	0.13			0.49	0.12		1.48	0.58			2.06	1.11	0.14	3.31	0.61	2.70
1974	0.04	0.02	0.30	0.13			0.49	0.12		1.48	0.89			2.37	1.11	0.14	3.62	0.61	3.01
1975	0.04	0.02	0.30	0.13			0.49	0.22	0.25	1.48	0.97			2.70	1.11	0.14	3.95	0.71	3.24
1976	0.04	0.02	0.30	0.13	0.09		0.58	0.12		1.48	0.97	0.70		3.15	1.11	0.27	4.53	0.70	3.83
1977	0.04	0.02	0.30	0.13	0.09		0.58	0.17	0.13	1.48	0.97	0.95		3.53	1.11	0.27	4.91	0.75	4.16
1978	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.54	3.94	1.11	0.27	5.32	0.77	4.55
1979	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12	0.02	1.48	0.97	0.95	0.91	4.33	1.11	0.27	5.71	0.77	4.94
1980	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1981	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1982	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1983	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1984	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1985	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1986	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1987	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1988	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1989	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1990	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1991	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1992	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.77	4.92
1993	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
1994	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
1995	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
1996	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
1997	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
1998	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
1999	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2000	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2001	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2002	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2003	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2004	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2005	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2006	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2007	0.04	0.02	0.30	0.13	0.09	0.07	0.65	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.77	5.15
2008	0.04			0.13	0.09	0.07	0.33	0.12			0.97	0.95	0.91	2.83		0.27	3.10	0.45	2.65
2009	0.04			0.13	0.09	0.07	0.33	0.12			0.97	0.95	0.91	2.83		0.27	3.10	0.45	2.65
2010	0.02			0.13	0.09	0.07	0.31	0.06			0.97	0.95	0.91	2.83		0.27	3.10	0.37	2.73
2011	0.02			0.13	0.09	0.07	0.31	0.06			0.97	0.95	0.91	2.83		0.27	3.10	0.37	2.73
2012				0.13	0.09	0.07	0.29				0.97	0.95	0.91	2.83		0.27	3.10	0.29	2.81
2013					0.09	0.07	0.16					0.95	0.91	1.86		0.27	2.13	0.16	1.97
2014					0.09	0.07	0.16					0.95	0.91	1.86		0.27	2.13	0.16	1.97
2015					0.09	0.07	0.16					0.95	0.91	1.86		0.27	2.13	0.16	1.97
2016						0.07	0.07						0.91	0.91		0.27	1.18	0.07	1.11
2017						0.07	0.07						0.91	0.91		0.27	1.18	0.07	1.11

Projects completed
in 1967 and later.

Table 15.

ALTERNATIVE B.

NET RECEIPTS FROM OPERATIONS.

(In Millions of Dollars)

Year	Operation & Maintenance: Akureyri Reserve Station (1)	Operation & Maintenance: North-South H.T.Line (2)	Operation & Maintenance: Búrfell I 105 MW (3)	Operation & Maintenance: Búrfell II 35 MW (4)	Operation & Maintenance: Búrfell III 35 MW (5)	Operation & Maintenance: Búrfell IV 35 MW (6)	Total O & M (7)	Fuel for Thermal Stations (8)	Income: General Load: Thermal Stations (9)	Income: General Load: Búrfell I (10)	Income: General Load: Búrfell II (11)	Income: General Load: Búrfell III (12)	Income: General Load: Búrfell IV (13)	Income: Total G.L. (14)	Income: Smelter Búrfell I (15)	Income: Secondary Load (16)	Income: Total Income (14+15+16) (17)	Operational Cost Total (7+8) (18)	Net Receipts from Operations (18-17) (19)
1968	0.04	0.05	0.30				0.39	0.05		0.60				0.60	1.11	0.14	1.85	0.44	1.41
1969	0.04	0.05	0.30				0.39	0.05		0.95				0.95	1.11	0.14	2.20	0.44	1.76
1970	0.04	0.05	0.30				0.39	0.08		1.22				1.22	1.11	0.14	2.47	0.47	2.00
1971	0.04	0.05	0.30				0.39	0.09	0.05	1.44				1.49	1.11	0.11	2.71	0.48	2.23
1972	0.04	0.05	0.30				0.39	0.23	0.28	1.48				1.76	1.11	0.07	2.94	0.62	2.32
1973	0.04	0.05	0.30	0.13			0.52	0.12		1.48	0.58			2.06	1.11	0.14	3.31	0.64	2.67
1974	0.04	0.05	0.30	0.13			0.52	0.12		1.48	0.89			2.37	1.11	0.14	3.62	0.64	2.98
1975	0.04	0.05	0.30	0.13			0.52	0.22	0.25	1.48	0.97			2.70	1.11	0.14	3.95	0.74	3.21
1976	0.04	0.05	0.30	0.13	0.09		0.61	0.12		1.48	0.97	0.70		3.15	1.11	0.27	4.53	0.73	3.80
1977	0.04	0.05	0.30	0.13	0.09		0.61	0.17	0.13	1.48	0.97	0.95		3.53	1.11	0.27	4.91	0.78	4.13
1978	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.54	3.94	1.11	0.27	5.32	0.80	4.52
1979	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12	0.02	1.48	0.97	0.95	0.91	4.33	1.11	0.27	5.71	0.80	4.91
1980	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1981	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1982	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1,48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1983	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1984	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1985	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1986	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1987	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1988	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1989	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1990	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1991	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1992	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.11	0.27	5.69	0.80	4.89
1993	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
1994	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
1995	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
1996	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
1997	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
1998	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
1999	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2000	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2001	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2002	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2003	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2004	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2005	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2006	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2006	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2007	0.04	0.05	0.30	0.13	0.09	0.07	0.68	0.12		1.48	0.97	0.95	0.91	4.31	1.34	0.27	5.92	0.80	5.12
2008				0.13	0.09	0.07	0.29				0.97	0.95	0.91	2.83		0.27	3.10	0.29	2.81
2009				0.13	0.09	0.07	0.29				0.97	0.95	0.91	2.83		0.27	3.10	0.29	2.81
2010				0.13	0.09	0.07	0.29				0.97	0.95	0.91	2.83		0.27	3.10	0.29	2.81
2011				0.13	0.09	0.07	0.29				0.97	0.95	0.91	2.83		0.27	3.10	0.29	2.81
2012				0.13	0.09	0.07	0.29				0.97	0.95	0.91	2.83		0.27	3.10	0.29	2.81
2013					0.09	0.07	0.16					0.95	0.91	1.86		0.27	2.13	0.16	1.97
2014					0.09	0.07	0.16					0.95	0.91	1.86		0.27	2.13	0.16	1.97
2015					0.09	0.07	0.16					0.95	0.91	1.86		0.27	2.13	0.16	1.97
2016						0.07	0.07						0.91	0.91		0.27	1.18	0.07	1.11
2017						0.07	0.07						0.91	0.91		0.27	1.18	0.07	1.11

Projects completed
in 1967 and later.

Table 16.

ALTERNATIVE C.

NET RECEIPTS FROM OPERATIONS.

(In Millions of Dollars)

Year	Operation & Maintenance					Fuel for Thermal Stations	Assumed contribution to 13.5 MW Ellidaár Thermal Station	Income					Operational Cost	Net Receipts from Operations
	Thermal Stations (1)	Hveragerdi (2)	Efstidalur (3)	Laxá III (4)	Total O & M (5)	(6)	(7)	Thermal Stations (8)	Hveragerdi (9)	Efstidalur (10)	Laxá III (11)	Total Income (12)	Total: (5+6+7) (13)	(12-13) (14)
1968		0.29		0.04	0.33				0.46		0.14	0.60	0.33	0.27
1969		0.29		0.04	0.33				0.68		0.18	0.86	0.33	0.53
1970	0.02	0.29		0.04	0.35	0.01		0.02	0.90		0.17	1.09	0.36	0.73
1971	0.02	0.29		0.04	0.35	0.09		0.27	0.94		0.18	1.39	0.44	0.95
1972	0.02	0.29	0.09	0.04	0.44	0.04		0.08	0.94	0.45	0.18	1.65	0.48	1.17
1973	0.02	0.29	0.09	0.04	0.44	0.11		0.24	0.94	0.59	0.19	1.96	0.55	1.41
1974	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1975	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1976	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1977	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1978	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1979	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1980	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1981	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1982	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1983	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1984	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1985	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1986	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1987	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1988	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1989	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1990	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1991	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1992	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1993	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1994	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1995	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1996	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1997	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1998	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
1999	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2000	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2001	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2002	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2003	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2004	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2005	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2006	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2007	0.02	0.29	0.09	0.04	0.44	0.20	0.21	0.48	0.94	0.65	0.20	2.27	0.85	1.42
2008	0.02		0.09		0.11	0.20	0.21	0.48		0.65		1.13	0.52	0.61
2009	0.02		0.09		0.11	0.20	0.21	0.48		0.65		1.13	0.52	0.61
2010			0.09		0.09					0.65		0.65	0.09	0.56
2011			0.09		0.09					0.65		0.65	0.09	0.56

Projects completed
in 1967 and later

ALTERNATIVE A:

YIELD OF TOTAL INVESTMENT.

(In Millions of Dollars)

Year	Investment: Reserve Station (1)	Investment: North-South H.T.Line (2)	Investment: Búrfell I 105 MW (3)	Investment: Búrfell II 35MW (4)	Investment: Búrfell III 35 MW (5)	Investment: Búrfell IV 35 MW (6)	Total Investment (7)	Net Receipts from Operations (Table 14) (8)	Total Cash Flow (8-7) (9)	Present Worth of Total Cash Flow (1967) 6 % (10)	8 % (11)	9 % (12)
Before ´64			0.80				0.80	-	- 0.80	- 1.01	- 1.09	- 1.13
1964			0.85				0.85	-	- 0.85	- 1.01	- 1.07	- 1.10
1965			6.62				6.62	-	- 6.62	- 7.44	- 7.72	- 7.86
1966		0.80	9.48				10.28	-	-10.28	-10.90	-11.10	-11.20
1967		1.25	7.29				8.54	-	- 8.54	- 8.54	- 8.54	- 8.54
1968	0.40						0.40	1.48	1.08	1.02	1.00	0.99
1969	1.40						1.40	1.83	0.43	0.38	0.37	0.36
1970	0.40			0.15			0.55	2.05	1.50	1.26	1.19	1.16
1971	1.40			2.31			3.71	2.28	- 1.43	- 1.13	- 1.05	- 1.01
1972				1.53			1.53	2.35	0.82	0.61	0.56	0.53
1973					0.16		0.16	2.70	2.54	1.79	1.60	1.51
1974					3.57		3.57	3.01	- 0.56	- 0.37	- 0.33	- 0.31
1975					3.23		3.23	3.24	0.01	0.01	0.01	0.01
1976						0.54	0.54	3.83	3.29	1.95	1.65	1.51
1977						0.88	0.88	4.16	3.28	1.83	1.52	1.38
1978								4.55	4.55	2.40	1.95	1.76
1979								4.94	4.94	2.45	1.96	1.76
1980								4.92	4.92	2.31	1.81	1.60
1981								4.92	4.92	2.18	1.67	1.47
1982								4.92	4.92	2.05	1.55	1.35
1983								4.92	4.92	1.94	1.44	1.24
1984								4.92	4.92	1.83	1.33	1.14
1985								4.92	4.92	1.72	1.23	1.04
1986								4.92	4.92	1.63	1.14	0.96
1987								4.92	4.92	1.53	1.06	0.88
1988								4.92	4.92	1.45	0.98	0.80
1989								4.92	4.92	1.36	0.90	0.74
1990								4.92	4.92	1.29	0.84	0.68
1991								4.92	4.92	1.21	0.78	0.62
1992								4.92	4.92	1.15	0.72	0.57
1993								5.15	5.15	1.13	0.70	0.55
1994								5.15	5.15	1.07	0.64	0.50
1995								5.15	5.15	1.01	0.60	0.46
1996								5.15	5.15	0.95	0.55	0.42
1997								5.15	5.15	0.90	0.51	0.39
1998								5.15	5.15	0.85	0.47	0.36
1999								5.15	5.15	0.80	0.44	0.33
2000								5.15	5.15	0.75	0.41	0.30
2001								5.15	5.15	0.71	0.38	0.27
2002								5.15	5.15	0.67	0.35	0.25
2003								5.15	5.15	0.63	0.32	0.23
2004								5.15	5.15	0.60	0.30	0.21
2005								5.15	5.15	0.56	0.28	0.19
2006								5.15	5.15	0.53	0.26	0.17
2007								5.15	5.15	0.50	0.24	0.16
2008								2.65	2.65	0.24	0.11	0.08
2009								2.65	2.65	0.23	0.10	0.07
2010								2.73	2.73	0.22	0.10	0.07
2011								2.73	2.73	0.21	0.10	0.06
2012								2.81	2.81	0.20	0.09	0.06
2013								1.97	1.97	0.14	0.06	0.04
2014								1.97	1.97	0.13	0.06	0.03
2015								1.97	1.97	0.12	0.05	0.03
2016								1.11	1.11	0.06	0.02	0.02
2017								1.11	1.11	0.06	0.02	0.01
										18.22	3.52	- 1.83

$$\text{Yield} = 8 + \frac{3.52}{18.3+3.52} = 8,7\ \%$$

Projects completed
in 1967 and later

Table 18.

ALTERNATIVE B.

YIELD OF TOTAL INVESTMENT.

(In Millions of Dollars).

Year	Investment: Akureyri Reserve Station (1)	Investment: North-South H.T.Line (2)	Investment: Búrfell I 105 MW (3)	Investment: Búrfell II 35 MW (4)	Investment: Búrfell III 35 MW (5)	Investment: Búrfell IV 35 MW (6)	Total Investment (7)	Net Receipts from Operations (Table 15) (8)	Total Cash Flow (8-9) (9)	Present Worth of Total Cash Flow (1967) 6 % (10)	7 % (11)	8 % (12)
Before 1964			0.80				0.80		- 0.80	- 1.01	- 1.05	- 1.09
1964			0.85				0.85		- 0.85	- 1.01	- 1.04	- 1.07
1965			6.62				6.62		- 6.62	- 7.44	- 7.58	- 7.72
1966	0.60	2.00	9.48				12.08		-12.08	-12.80	-12.93	-13.05
1967	3.40	3.00	7.18				13.58		-13.58	-13.58	-13.58	-13.58
1968								1.41	1.41	1.33	1.32	1.30
1969								1.76	1.76	1.57	1.54	1.51
1970				0.15			0.15	2.00	1.85	1.55	1.51	1.47
1971				2.31			2.31	2.23	- 0.08	- 0.06	- 0.06	- 0.06
1972				1.53			1.53	2.32	0.79	0.59	0.56	0.54
1973					0.16		0.16	2.67	2.51	1.77	1.67	1.58
1974					3.57		3.57	2.98	- 0.59	- 0.39	- 0.37	- 0.34
1975					3.23		3.23	3.21	- 0.02	- 0.01	- 0.01	- 0.01
1976						0.54	0.54	3.80	3.26	1.93	1.77	1.63
1977						0.88	0.88	4.13	3.25	1.81	1.65	1.51
1978								4.52	4.52	2.38	2.15	1.94
1979								4.91	4.91	2.44	2.18	1.95
1980								4.89	4.89	2.29	2.03	1.80
1981								4.89	4.89	2.16	1.90	1.67
1982								4.89	4.89	2.04	1.77	1.54
1983								4.89	4.89	1.92	1.66	1.43
1984								4.89	4.89	1.82	1.55	1.32
1985								4.89	4.89	1.71	1.45	1.22
1986								4.89	4.89	1.62	1.35	1.13
1987								4.89	4.89	1.52	1.26	1.05
1988								4.89	4.89	1.44	1.18	0.97
1989								4.89	4.89	1.36	1.10	0.90
1990								4.89	4.89	1.28	1.03	0.83
1991								4.89	4.89	1.21	0.96	0.77
1992								4.89	4.89	1.14	0.90	0.71
1993								5.12	5.12	1.12	0.88	0.69
1994								5.12	5.12	1.06	0.82	0.64
1995								5.12	5.12	1.00	0.77	0.59
1996								5.12	5.12	0.95	0.72	0.55
1997								5.12	5.12	0.89	0.67	0.51
1998								5.12	5.12	0.84	0.63	0.47
1999								5.12	5.12	0.79	0.59	0.44
2000								5.12	5.12	0.75	0.55	0.41
2001								5.12	5.12	0.71	0.51	0.38
2002								5.12	5.12	0.67	0.48	0.35
2003								5.12	5.12	0.63	0.45	0.32
2004								5.12	5.12	0.59	0.42	0.30
2005								5.12	5.12	0.56	0.40	0.28
2006								5.12	5.12	0.53	0.37	0.26
2007								5.12	5.12	0.50	0.34	0.24
2008								2.81	2.81	0.26	0.17	0.12
2009								2.81	2.81	0.24	0.16	0.11
2010								2.81	2.81	0.22	0.15	0.11
2011								2.81	2.81	0.21	0.14	0.10
2012								2.81	2.81	0.20	0.13	0.09
2013								1.97	1.97	0.13	0.09	0.06
2014								1.97	1.97	0.13	0.08	0.05
2015								1.97	1.97	0.12	0.08	0.05
2016								1.11	1.11	0.06	0.04	0.03
2017								1.11	1.11	0.06	0.04	0.02
										13.80	5.55	- 0.98

$$\text{Yield} = 7 + \frac{5.55}{0.98+5.55} = 7.8\ \%$$

Projects completed
in 1967 and later

Table 19.

ALTERNATIVE C.

YIELD OF TOTAL INVESTMENT.

(In Millions of Dollars)

Year	Investment					Net Receipts from Operations (Table 16)	Total Cash Flow (6-5)	Present Worth of Total Cash Flow (1967)		
	Thermal Station	Hvera-gerdi	Efsti-dalur	Laxá III	Total Investment			6 %	7 %	8 %
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Before 1964		0.64	0.08	0.12	0.84		-0.84	-1.06	-1.10	-1.14
1964							-	-	-	-
1965		0.35		0.44	0.79		-0.79	-0.89	-0.90	-0.92
1966		2.76		0.93	3.69		-3.69	-3.91	-3.95	-3.98
1967		2.69		1.53	4.22		-4.22	-4.22	-4.22	-4.22
1968	0.14				0.14	0.27	0.13	0.12	0.12	0.12
1969	0.70		1.30		2.00	0.53	-1.47	-1.31	-1.28	-1.26
1970			2.60		2.60	0.73	-1.87	-1.57	-1.53	-1.48
1971			2.47		2.47	0.95	-1.52	-1.20	-1.16	-1.12
1972						1.17	1.17	0.87	0.83	0.80
1973						1.41	1.41	0.99	0.94	0.89
1974						1.42	1.42	0.94	0.88	0.83
1975						1.42	1.42	0.89	0.83	0.77
1976						1.42	1.42	0.84	0.77	0.71
1977						1.42	1.42	0.79	0.72	0.66
1978						1.42	1.42	0.75	0.67	0.61
1979						1.42	1.42	0.71	0.63	0.56
1980						1.42	1.42	0.67	0.59	0.52
1981						1.42	1.42	0.63	0.55	0.48
1982						1.42	1.42	0.59	0.51	0.45
1983						1.42	1.42	0.56	0.48	0.41
1984						1.42	1.42	0.53	0.45	0.38
1985		0.28			0.28	1.42	1.14	0.40	0.34	0.28
1986		2.21			2.21	1.42	-0.79	-0.26	-0.22	-0.18
1987		2.15			2.15	1.42	-0.73	-0.23	-0.19	-0.16
1988	0.11				0.11	1.42	1.31	0.38	0.32	0.26
1989	0.56				0.56	1.42	0.86	0.24	0.19	0.16
1990						1.42	1.42	0.37	0.30	0.24
1991						1.42	1.42	0.35	0.28	0.22
1992						1.42	1.42	0.33	0.26	0.21
1993						1.42	1.42	0.31	0.24	0.19
1994						1.42	1.42	0.29	0.23	0.18
1995						1.42	1.42	0.28	0.21	0.16
1996						1.42	1.42	0.26	0.20	0.15
1997						1.42	1.42	0.25	0.19	0.14
1998						1.42	1.42	0.23	0.17	0.13
1999						1.42	1.42	0.22	0.16	0.12
2000						1.42	1.42	0.21	0.15	0.11
2001						1.42	1.42	0.20	0.14	0.10
2002						1.42	1.42	0.18	0.13	0.10
2003						1.42	1.42	0.17	0.12	0.09
2004						1.42	1.42	0.16	0.12	0.09
2005						1.42	1.42	0.15	0.11	0.08
2006						1.42	1.42	0.15	0.10	0.07
2007						1.42	1.42	0.14	0.09	0.06
2008						0.61	0.61	0.06	0.04	0.03
2009						0.61	0.61	0.05	0.04	0.02
2010						0.56	0.56	0.05	0.03	0.02
2011						0.56	0.56	0.04	0.03	0.02
								0.70	-1.39	-3.04

$$\text{Yield} = 6 + \frac{0.70}{0.70+1.39} = 6.3\ \%$$

Projects completed
in 1967 and later

Table 20.

ALTERNATIVE A.

YIELD OF EQUITY.

(In Millions of Dollars)

Year	Investment: Financed by Loans (1)	Investment: Financed by Equity (2)	Debt Service: Reserve Station (3)	Debt Service: North-South H.T.Line (4)	Debt Service: Burfell I 105 MW (5)	Debt Service: Burfell II 35 MW (6)	Debt Service: Burfell III 35 MW (7)	Debt Service: Burfell IV 35 MW (8)	Total Debt Service (9)	Net Receipts from Operations (Table 14) (10)	Net Cash Flow (10-2-9) (11)	Present Worth of Net Cash Flow (1967): 8 %	11 %	12 %
Before 1964	-	0.80									-0.80	-1.09	-1.21	-1.26
1964	-	0.85									-0.85	-1.07	-1.16	-1.19
1965	5.87	0.75									-0.75	-0.87	-0.92	-0.94
1966	8.98	1.30									-1.30	-1.40	-1.44	-1.46
1967	7.24	1.30									-1.30	-1.30	-1.30	-1.30
1968	0.32	0.08		0.11	1.33				1.44	1.48	-0.04	-0.04	-0.04	-0.04
1969	1.12	0.28		0.11	1.33				1.44	1.83	0.11	0.09	0.09	0.09
1970	0.44	0.11	0.09	0.11	1.93				2.13	2.05	-0.19	-0.15	-0.14	-0.14
1971	2.97	0.74	0.14	0.16	1.93				2.23	2.28	-0.69	-0.51	-0.45	-0.44
1972	1.22	0.31	0.23	0.16	1.93				2.32	2.35	-0.28	-0.19	-0.17	-0.16
1973	0.13	0.03	0.28	0.16	1.93	0.21			2.58	2.70	0.09	0.06	0.05	0.05
1974	2.86	0.71	0.28	0.16	1.93	0.21			2.58	3.01	-0.28	-0.16	-0.13	-0.13
1975	2.58	0.65	0.28	0.16	1.93	0.30			2.67	3.24	-0.08	-0.04	-0.03	-0.03
1976	0.43	0.11	0.28	0.16	1.93	0.30	0.36		3.03	3.83	0.69	0.35	0.27	0.25
1977	0.70	0.18	0.28	0.16	1.93	0.30	0.36		3.03	4.16	0.95	0.44	0.33	0.31
1978			0.28	0.16	1.93	0.30	0.52	0.07	3.26	4.55	1.29	0.55	0.41	0.37
1979			0.28	0.16	1.93	0.30	0.52	0.07	3.26	4.94	1.68	0.67	0.48	0.43
1980			0.28	0.16	1.93	0.30	0.52	0.07	3.26	4.92	1.66	0.61	0.43	0.38
1981			0.28	0.16	1.93	0.30	0.52	0.10	3.29	4.92	1.63	0.56	0.38	0.33
1982			0.28	0.16	1.93	0.30	0.52	0.10	3.29	4.92	1.63	0.51	0.34	0.30
1983			0.28	0.16	1.93	0.30	0.52	0.10	3.29	4.92	1.63	0.48	0.31	0.27
1984			0.28	0.16	1.93	0.30	0.52	0.10	3.29	4.92	1.63	0.44	0.28	0.24
1985			0.28	0.16	1.93	0.30	0.52	0.10	3.29	4.92	1.63	0.41	0.25	0.21
1986			0.28	0.16	1.93	0.30	0.52	0.10	3.29	4.92	1.63	0.38	0.22	0.19
1987			0.28	0.16	1.93	0.30	0.52	0.10	3.29	4.92	1.63	0.35	0.20	0.17
1988			0.14	0.16	1.93	0.30	0.52	0.10	3.15	4.92	1.77	0.35	0.20	0.16
1989			0.14	0.16	1.93	0.30	0.52	0.10	3.15	4.92	1.77	0.33	0.18	0.15
1990				0.16		0.30	0.52	0.10	1.08	4.92	3.84	0.65	0.35	0.28
1991						0.30	0.52	0.10	0.92	4.92	4.00	0.63	0.33	0.26
1992						0.30	0.52	0.10	0.92	4.92	4.00	0.58	0.29	0.24
1993						0.30	0.52	0.10	0.92	5.15	4.23	0.57	0.28	0.22
1994						0.30	0.52	0.10	0.92	5.15	4.23	0.53	0.25	0.20
1995							0.52	0.10	0.62	5.15	4.53	0.53	0.24	0.19
1996							0.52	0.10	0.62	5.15	4.53	0.49	0.22	0.17
1997							0.52	0.10	0.62	5.15	4.53	0.45	0.20	0.15
1998								0.10	0.10	5.15	5.05	0.46	0.20	0.15
1999								0.10	0.10	5.15	5.05	0.43	0.18	0.13
2000								0.10	0.10	5.15	5.05	0.40	0.16	0.12
2001										5.15	5.15	0.38	0.15	0.11
2002										5.15	5.15	0.35	0.13	0.10
2003										5.15	5.15	0.32	0.12	0.09
2004										5.15	5.15	0.30	0.11	0.08
2005										5.15	5.15	0.28	0.10	0.07
2006										5.15	5.15	0.26	0.09	0.06
2007										5.15	5.15	0.24	0.08	0.05
2008										2.65	2.65	0.11	0.04	0.03
2009										2.65	2.65	0.10	0.03	0.02
2010										2.73	2.73	0.10	0.03	0.02
2011										2.73	2.73	0.09	0.03	0.02
2012										2.81	2.81	0.09	0.03	0.02
2013										1.97	1.97	0.06	0.02	0.01
2014										1.97	1.97	0.05	0.01	0.01
2015										1.97	1.97	0.05	0.01	0.01
2016										1.11	1.11	0.03	0.01	0.00
2017										1.11	1.11	0.02	0.01	0.00
												8.31	1.13	-0.38

$$\text{Yield} = 11 + \frac{1.13}{0.38+1.13} = 11.7\ \%$$

Projects completed
in 1967 and later

ALTERNATIVE B.

YIELD OF EQUITY.

(In Millions of Dollars)

Year	Investment: Financed by Loans (1)	Investment: Financed by Equity (2)	Debt Service: Akureyri Reserve Station (3)	Debt Service: North-South H.T.Line (4)	Debt Service: Búrfell I 105 MW (5)	Debt Service: Búrfell II 35 MW (6)	Debt Service: Búrfell III 35 MW (7)	Debt Service: Búrfell IV 35 MW (8)	Total Debt Service (9)	Net Receipts from Operations (Table 15) (10)	Net Cash Flow (10-2-9) (11)	Present Worth of Total Cash Flow (1967) 8 %	9 %	10 %
Before 1964	-	0.80									-0.80	-1.09	-1.13	-1.17
1964	-	0.85									-0.85	-1.07	-1.10	-1.13
1965	5.37	1.25									-1.25	-1.46	-1.48	-1.51
1966	9.78	2.30									-2.30	-2.48	-2.51	-2.53
1967	11.28	2.30									-2.30	-2.30	-2.30	-2.30
1968	-	-	0.21	0.26	1.24				1.71	1.41	-0.30	-0.28	-0.27	-0.27
1969	-	-	0.33	0.26	1.24				1.83	1.76	-0.07	-0.06	-0.06	-0.06
1970	0.12	0.03	0.33	0.26	1.81				2.40	2.00	-0.43	-0.34	-0.33	-0.32
1971	1.85	0.46	0.33	0.38	1.81				2.52	2.23	-0.75	-0.55	-0.53	-0.51
1972	1.22	0.31	0.33	0.38	1.81				2.52	2.32	-0.51	-0.35	-0.33	-0.32
1973	0.13	0.03	0.33	0.38	1.81	0.21			2.73	2.67	-0.09	-0.06	-0.05	-0.05
1974	2.86	0.71	0.33	0.38	1.81	0.21			2.73	2.98	-0.46	-0.27	-0.25	-0.24
1975	2.58	0.65	0.33	0.38	1.81	0.30			2.82	3.21	-0.26	-0.14	-0.13	-0.12
1976	0.43	0.11	0.33	0.38	1.81	0.30	0.36		3.18	3.80	0.51	0.26	0.23	0.22
1977	0.70	0.18	0.33	0.38	1.81	0.30	0.36		3.18	4.13	0.77	0.36	0.33	0.30
1978			0.33	0.38	1.81	0.30	0.52	0.07	3.41	4.52	1.11	0.48	0.43	0.39
1979			0.33	0.38	1.81	0.30	0.52	0.07	3.41	4.91	1.50	0.60	0.53	0.48
1980			0.33	0.33	1.81	0.30	0.52	0.07	3.41	4.89	1.48	0.54	0.48	0.43
1981			0.33	0.38	1.81	0.30	0.52	0.10	3.44	4.89	1.45	0.49	0.43	0.38
1982			0.33	0.38	1.81	0.30	0.52	0.10	3.44	4.89	1.45	0.46	0.40	0.35
1983			0.33	0.38	1.81	0.30	0.52	0.10	3.44	4.89	1.45	0.42	0.37	0.32
1984			0.33	0.38	1.81	0.30	0.52	0.10	3.44	4.89	1.45	0.39	0.34	0.29
1985			0.33	0.38	1.81	0.30	0.52	0.10	3.44	4.89	1.45	0.36	0.31	0.26
1986				0.38	1.81	0.30	0.52	0.10	3.11	4.89	1.78	0.41	0.35	0.29
1987				0.38	1.81	0.30	0.52	0.10	3.11	4.89	1.78	0.38	0.32	0.26
1988				0.38	1.81	0.30	0.52	0.10	3.11	4.89	1.78	0.35	0.29	0.24
1989				0.38	1.81	0.30	0.52	0.10	3.11	4.89	1.78	0.33	0.27	0.22
1990				0.38		0.30	0.52	0.10	1.30	4.89	3.59	0.61	0.49	0.40
1991						0.30	0.52	0.10	0.92	4.89	3.97	0.63	0.50	0.40
1992						0.30	0.52	0.10	0.92	4.89	3.97	0.58	0.46	0.37
1993						0.30	0.52	0.10	0.92	5.12	4.20	0.57	0.45	0.35
1994						0.30	0.52	0.10	0.92	5.12	4.20	0.53	0.41	0.32
1995							0.52	0.10	0.62	5.12	4.50	0.52	0.40	0.31
1996							0.52	0.10	0.62	5.12	4.50	0.48	0.37	0.28
1997							0.52	0.10	0.62	5.12	4.50	0.45	0.34	0.26
1998								0.10	0.10	5.12	5.02	0.46	0.35	0.26
1999								0.10	0.10	5.12	5.02	0.43	0.32	0.24
2000								0.10	0.10	5.12	5.02	0.40	0.29	0.22
2001										5.12	5.12	0.37	0.27	0.20
2002										5.12	5.12	0.35	0.25	0.18
2003										5.12	5.12	0.32	0.23	0.16
2004										5.12	5.12	0.30	0.21	0.15
2005										5.12	5.12	0.27	0.19	0.13
2006										5.12	5.12	0.25	0.18	0.12
2007										5.12	5.12	0.23	0.16	0.11
2008										2.81	2.81	0.12	0.08	0.06
2009										2.81	2.81	0.11	0.07	0.05
2010										2.81	2.81	0.10	0.07	0.05
2011										2.81	2.81	0.09	0.06	0.04
2012										2.81	2.81	0.09	0.06	0.04
2013										1.97	1.97	0.06	0.04	0.02
2014										1.97	1.97	0.05	0.03	0.02
2015										1.97	1.97	0.05	0.03	0.02
2016										1.11	1.11	0.03	0.02	0.01
2017										1.11	1.11	0.02	0.01	0.01
												3.85	0.95	-1.32

$$\text{Yield} = 9 + \frac{0.95}{1.32+0.95} = 9,4\ \%$$

Projects completed
in 1967 and later.

Table 22.

ALTERNATIVE C.

YIELD OF EQUITY.

(In Millions of Dollars)

Year	Investment: Financed by Loans (1)	Investment: Financed by Equity (2)	Debt Service: Thermal Stations (3)	Debt Service: Hvera-gerdi (4)	Debt Service: Efsti-dalur (5)	Debt Service: Laxá III (6)	Total Debt Service (7)	Net Receipts from Operations (Table 16) (8)	Net Cash Flow (8-2-7) (9)	Present Worth of Total Cash Flow (1967): 6 % (10)	7 % (11)	8 % (12)
Before 1964	-	0.84							-0.84	-1.06	-1.10	-1.14
1964	-	-							-	-	-	-
1965	0.64	0.15							-0.15	-0.17	-0.17	-0.17
1966	3.54	0.15							-0.15	-0.16	-0.16	-0.16
1967	3.46	0.76							-0.76	-0.76	-0.76	-0.76
1968	0.11	0.03		0.52		0.16	0.68	0.27	-0.44	-0.41	-0.41	-0.41
1969	1.60	0.40		0.52		0.16	0.68	0.53	-0.55	-0.49	-0.48	-0.47
1970	2.08	0.52	0.04	0.52		0.23	0.79	0.73	-0.58	-0.49	-0.47	-0.46
1971	1.98	0.49	0.07	0.52		0.23	0.82	0.95	-0.36	-0.28	-0.27	-0.26
1972			0.07	0.52	0.33	0.23	1.15	1.17	0.02	0.01	0.01	0.01
1973			0.07	0.52	0.33	0.23	1.15	1.41	0.26	0.18	0.17	0.16
1974			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.08	0.07	0.07
1975			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.07	0.07	0.06
1976			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.07	0.06	0.06
1977			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.07	0.06	0.06
1978			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.06	0.06	0.05
1979			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.06	0.05	0.05
1980			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.06	0.05	0.04
1981			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.05	0.05	0.04
1982			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.05	0.04	0.04
1983			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.05	0.04	0.03
1984			0.07	0.52	0.48	0.23	1.30	1.42	0.12	0.04	0.04	0.03
1985	0.22	0.06	0.07		0.48	0.23	0.78	1.42	0.58	0.20	0.17	0.14
1986	1.77	0.44	0.07		0.48	0.23	0.78	1.42	0.20	0.07	0.05	0.05
1987	1.72	0.43	0.07		0.48	0.23	0.78	1.42	0.21	0.06	0.05	0.04
1988	0.09	0.02		0.38	0.48	0.23	1.09	1.42	0.31	0.09	0.08	0.06
1989	0.45	0.11		0.38	0.48	0.23	1.09	1.42	0.22	0.06	0.05	0.04
1990			0.03	0.38	0.48		0.89	1.42	0.53	0.14	0.11	0.09
1991			0.05	0.38	0.48		0.91	1.42	0.51	0.13	0.10	0.08
1992			0.05	0.38	0.48		0.91	1.42	0.51	0.12	0.10	0.07
1993			0.05	0.38	0.48		0.91	1.42	0.51	0.11	0.09	0.07
1994			0.05	0.38			0.43	1.42	0.99	0.21	0.16	0.12
1995			0.05	0.38			0.43	1.42	0.99	0.20	0.15	0.12
1996			0.05	0.38			0.43	1.42	0.99	0.18	0.14	0.11
1997			0.05	0.38			0.43	1.42	0.99	0.17	0.13	0.10
1998			0.05	0.38			0.43	1.42	0.99	0.16	0.12	0.09
1999			0.05	0.38			0.43	1.42	0.99	0.15	0.12	0.08
2000			0.05	0.38			0.43	1.42	0.99	0.15	0.11	0.08
2001			0.05	0.38			0.43	1.42	0.99	0.14	0.10	0.07
2002			0.05	0.38			0.43	1.42	0.99	0.13	0.09	0.07
2003			0.05	0.38			0.43	1.42	0.99	0.12	0.09	0.06
2004			0.05	0.38			0.43	1.42	0.99	0.12	0.08	0.06
2005			0.05				0.05	1.42	1.37	0.15	0.10	0.07
2006			0.05				0.05	1.42	1.37	0.14	0.10	0.07
2007			0.05				0.05	1.42	1.37	0.13	0.09	0.06
2008								0.61	0.61	0.06	0.04	0.03
2009								0.61	0.61	0.05	0.04	0.02
2010								0.56	0.56	0.05	0.03	0.02
2011								0.56	0.56	0.04	0.03	0.02
										0.36	-0.58	-1.24

$$\text{Yield of Equity} = 6 + \frac{0.36}{0.36+0.58} = 6{,}4\ \%$$

Projects completed
in 1967 and later.

Table 23.

ALTERNATIVE A.

Financing.

(In Millions of Dollars)

		Construction expenditure (1)	Financed by: Equity (2)	Loan (3)	Interest during construction I (4)	II (5)	III (6)	Total (7)	Total loan disbursement (8)
Búrfell I	Before 1964	0.80	0.80						
	1964	0.85	0.85						
	1965	6.62	0.75	5.87	0.18			0.18	6.05
	1966	9.48	1.20	8.28	0.36	0.25		0.61	8.89
	1967	7.29	1.11	6.18	0.38	0.51	0.18	1.07	7.25
		25.04	4.71	20.33	0.92	0.76	0.18	1.86	22.19
North-South H.T. Line	1966	0.80	0.10	0.70	0.02			0.02	0.72
	1967	1.25	0.19	1.06	0.04	0.03		0.07	1.13
		2.05	0.29	1.76	0.06	0.03		0.09	1.85
Reserve Station I	1968	0.40	0.08	0.32	0.01			0.01	0.33
	1969	1.40	0.28	1.12	0.02	0.03		0.05	1.17
		1.80	0.36	1.44	0.03	0.03		0.06	1.50
Reserve Station II	1970	0.40	0.08	0.32	0.01			0.01	0.33
	1971	1.40	0.28	1.12	0.02	0.03		0.05	1.17
		1.80	0.36	1.44	0.03	0.03		0.06	1.50
Búrfell II	1970	o.15	0.03	0.12	0.00			0.00	0.12
	1971	2.31	0.46	1.85	0.01	0.06		0.07	1.92
	1972	1.53	0.31	1.22	0.01	0.11	0.04	0.16	1.38
		3.99	0.80	3.19	0.02	0.17	0.04	0.23	3.42
Búrfell III	1973	0.16	0.03	0.13	0.00			0.00	0.13
	1974	3.57	0.71	2.86	0.01	0.09		0.10	2.96
	1975	3.23	0.65	2.58	0.01	0.18	0.08	0.27	2.85
		6.96	1.39	5.57	0.02	0.27	0.08	0.37	5.94
Búrfell IV	1976	0.54	0.11	0.43	0.01			0.01	0.44
	1977	0.88	0.18	0.70	0.03	0.02		0.05	0.75
		1.42	0.29	1.13	0.04	0.02		0.06	1.19

Projects completed
in 1967 and later.

Table 24.

ALTERNATIVE B.

Financing.

(In Millions of Dollars)

		Construction expenditure (1)	Financed by: Equity (2)	Loan (3)	Interest during construction I (4)	II (5)	III (6)	Total (7)	Total loan disbursement (8)
Búrfell I. Before 1964		0.80	0.80						
1964		0.85	0.85						
1965		6.62	1.25	5.37	0.16			0.16	5.53
1966		9.48	1.81	7.67	0.33	0.23		0.56	8.23
1967		7.18	1.22	5.96	0.35	0.47	0.18	1.00	6.96
		24.93	5.93	19.00	0.84	0.70	0.18	1.72	20.72
North-South H.T.Line	1966	2.00	0.38	1.62	0.05			0.05	1.67
	1967	3.00	0.51	2.49	0.10	0.07		0.17	2.66
		5.00	0.89	4.11	0.15	0.07		0.22	4.33
Reserve Station	1966	0.60	0.11	0.49	0.01			0.01	0.50
	1967	3.40	0.57	2.83	0.03	0.08		0.11	2.94
		4.00	0.68	3.32	0.04	0.08		0.12	3.44
Búrfell II	1970	o.15	0.03	0.12	0.00			0.00	0.12
	1971	2.31	0.46	1.85	0.01	0.06		0.07	1.92
	1972	1.53	0.31	1.22	0.01	0.11	0.04	0.16	1.38
		3.99	0.80	3.19	0.02	0.17	0.04	0.23	3.42
Búrfell III	1973	0.16	0.03	0.13	0.00			0.00	0.13
	1974	3.57	0.71	2.86	0.01	0.09		0.10	2.96
	1975	3.23	0.65	2.58	0.01	0.18	0.08	0.27	2.85
		6.96	1.39	5.57	0.02	0.27	0.08	0.37	5.94
Búrfell IV	1976	0.54	0.11	0.43	0.01			0.01	0.44
	1977	0.88	0.18	0.70	0.03	0.02		0.05	0.75
		1.42	0.29	1.13	0.04	0.02		0.06	1.19

Projects completed
in 1967 and later.

Table 25.

ALTERNATIVE C.

Financing.

(In Millions of Dollars)

		Construction expenditure (1)	Financed by: Equity (2)	Loan (3)	Interest during construction I (4)	II (5)	III (6)	Total (7)	Total loan disbursement (8)
Akureyri Thermal	1968	0.14	0.03	0.11					0.11
	1969	0.70	0.14	0.56	0.01	0.02		0.03	0.59
Total		0.84	0.17	0.67	0.01	0.02		0.03	0,70
Akureyri Thermal (replacement)	1988	0.11	0.02	0.09					0.09
	1989	0.56	0.11	0.45	0.01	0.01		0.02	0.47
Total		0.67	0.13	0.54	0.01	0.01		0.02	0.56
Hveragerdi	Before 1964	0.64	0.64						
	1965	0.35	0.07	0.28	0.01			0.01	0.29
	1966	2.76	0.11	2.65	0.02	0.08		0.10	2.75
	1967	2.69	0.48	2.21	0.02	0.16	0.07	0.25	2.46
Total		6.44	1.30	5.14	0.05	0.24	0.07	0.36	5.50
Hveragerdi (replacement)	1985	0.28	0.06	0.22	0.01			0.01	0.23
	1986	2.21	0.44	1.77	0.01	0.05		0.06	1.83
	1987	2.15	0.43	1.72	0.01	0.11	0.05	0.17	1.89
Total		4.64	0.93	3.71	0.03	0.16	0.05	0.24	3.95
Efstidalur	Before 1964	0.08	0.08						
	1969	1.30	0.26	1.04	0.04			0.04	1.08
	1970	2.60	0.52	2.08	0.06	0.06		0.12	2.20
	1971	2.47	0.49	1.98	0.07	0.13	0.06	0.26	2.24
Total		6.45	1.35	5.10	0.17	0.19	0.06	0.42	5.52
Laxá III	Before 1964	0.12	0.12						
	1965	0.44	0.08	0.36	0.01			0.01	0.37
	1966	0.93	0.04	0.89	0.02	0.03		0.05	0.94
	1967	1.53	0.28	1.25	0.02	0.05	0.04	0.11	1.36
Total		3.02	0.52	2.50	0.05	0.08	0.04	0.17	2.67

Projects completed in
1967 and later.

Table 26.

Alternative A and B.

Effects of increased price to smelter from 2,5 to 3,0 and 3,5 mills per KWh.

(In millions of dollars)

	Present worth at 6 %	7 %	8 %	9 %	10 %	11 %	12 %	Yield %
Additional revenue x)								
Price from 2,5 to 3,0 mills	2.81	2.56	2.35	2.16	2.00	1.85	1.72	
Price from 2,5 to 3,5 mills	5.75	5.24	4.80	4.42	4.08	3.79	3.53	
Total Cash Flow (cf. tables 17-18)								
Alternative A								
at 2,5 mills	18.22		3.52	-1.83				8,7
" 3,0 "	21.03		5.87	0.33				9,1
" 3,5 "	23.97		8.32	2.59				9,4
Alternative B								
at 2,5 mills	13.80	5.55	-0.98					7,8
" 3,0 "	16.61	8.11	1.37					8,2
" 3,5 "	19.55	10.79	3.82					8,5
Net Cash Flow (cf. tables 20-21)								
Alternative A								
at 2,5 mills			8.31			1.13	-0.38	11,7
" 3,0 "			10.66			2.98	1.34	12,8
" 3,5 "			13.11			4.92	3.15	13,8
Alternative B								
at 2,5 mills			3.85	0.95	-1.32			9,4
" 3,0 "			6.20	3.11	0.68			10,3
" 3,5 "			8,65	5.37	2.76			11,1

x) Annual revenue from smelter at 2,5 mills pr. KWh $ 1.11 million.
Annual additional revenue from smelter at 3,0 mills pr KWh $ 0.22 million for 25 years.
Annual additional revenue from smelter at 3,5 mills pr KWh $ 0.45 million for 25 years.