

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672
968 SCOMM44: HOUSE POWER ALTERNATIVES STUDY COMM. 1979-80

SCOMM

#44:15

JAY S. HAMMOND
GOVERNOR



STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

The Honorable Jalmar Kerttula
President of the Senate
Alaska State Legislature
Pouch V
Juneau, AK 99811

Dear Mr. President:

Under art. II, sec. 17 of the Alaska Constitution I am allowing FCCSB 25 to become law without my signature.

I have serious reservations regarding this bill despite its popularity with the legislature. Political realities suggest that a veto reflecting my dissatisfaction would be overridden.

Obviously, the legislature is determined to massively promote hydroelectric development through a system of grants. While I agree that there are many hydro projects throughout the state worthy of promotion, there are also many unworthy, both economically and environmentally. Moreover, I do not favor paying for this development with grants. In my view, low interest loans or partial grants plus bonding would inject a "market test" now absent and compel closer scrutiny of project viability before a community pressed for it.

It's no secret that this hydro bill was a bargaining chip in my efforts to secure a constitutional limitation on spending. Had the latter not passed, I would have vetoed both FCCS SB 25 and FCCS SB 26 for policy reasons even though legislative overrides would have been almost assured. Thus, to those who believe I paid too large a price, this price dwindles when one considers that had I not begrudgingly paid it, the legislature could have compelled it regardless. Moreover, had I not been willing to pay that price, there's no question but that there would have been no spending limitation proposal nor major contribution to the Permanent Fund, both of which are crucial to Alaska's financial future.

There are additional problems with the hydroelectric legislation. In an effort to prevent vetoes, the legislature linked the authorization and appropriation bills so as to

cause delay of those projects which are viable and ready to go should I veto either measure. The Department of Law advises that that provision may be binding. Additionally, not only have I assurances from key legislators that they'll work with me to correct some of the problems, but I have the means of compelling this help. Without their remedies, additional appropriations for questionable projects can be vetoed.

Most importantly, the legislature acceded to my demand that the Alaska Power Authority be reconstituted so that it could be held more closely accountable to policies consistent with public purposes.

While I would have preferred low interest loans or equitable grants, the legislature chose to provide total grants. Accordingly, it is my intent to make every effort next session to bring some equity into the program through amendments.

Pursuant to the advice of the Department of Law, I am pleased that certain blatantly unconstitutional provisions in FCCSSB 25 can be effectively thwarted. I believe that the so-called "blackmail" clause should be ignored. It is nothing more than the wishful thinking of one legislature attempting to bind the acts of future legislatures. The attempted dedication of power revenue for operation and maintenance of energy program projects will not be allowed. All amounts expended for operation and maintenance must first be appropriated by the legislature. The attempt to legislatively determine the path of the Anchorage to Fairbanks transmission line borders on special legislation. Certainly, the design and construction of power projects is presently governed by general law. There is no indication that this transmission line should receive special treatment by the legislature. The experts employed by the Alaska Power Authority will be the best qualified to determine where the right-of-way will be located. To require that the line pass through Denali State Park ignores the rights of all state residents to have generally applicable laws, which are not slanted toward special interests, set the uses and activities which are permitted in state parks.

Thus, while many urged me to veto this bill for the reasons stated above, I have chosen not to do so. Not only would it prove futile, but it is likely that it would so poison the water that I would destroy any chance of cooperation between

The Honorable Jalmar Kerttula -3-

Senate and House leadership and me next year to secure long-term improvements. Those who fear this bill as it now stands can help improve the results by proposing and supporting constructive amendments to be considered next year.

Sincerely,

Jay S. Hammond
Governor

MEMORANDUM

State of Alaska

TO: Representative Hugh Malone

DATE: June 2, 1981

FILE NO:

TELEPHONE NO:

FROM: Eric P. Yould *EPY*

SUBJECT: SB25 - Cost of Energy

You asked that I explain how the cost of energy would be established for energy sold from the State system of power projects after 500 megawatts of system capacity is in operation as provided in Sec. 44.83.490(b)(3) of House CS for CS for Sponsor Substitute for SB 25, dated 5/20/81. For each fiscal year the following information would be presented to the Legislature through the Executive Budget process:

1. Status report on funding and construction of projects under construction.
2. Capital cost of investment in projects in operation.
3. Estimated kwh sales of energy from individual projects in the State system.
4. An operation and maintenance budget for the fiscal year by project for the system.
5. A detailed accounting of expenditures from and additional funding requirements for a system contingency fund which would be utilized for unforeseen maintenance or operation requirements associated with the system of projects in operation. (This fund may be capitalized at a percentage of the market value of the system in operation.)
6. An estimated budget for the Power Cost Assistance Program.
7. A suggested rate for energy sales from the State system with an estimate of system revenues based upon the rate.

When 500 MW's of production capacity are in operation, the system may include anywhere from 5 to 15 projects of varying individual capacity. The capital investment could range from \$1 to \$2 billion dollars. Revenues from the State system must fund (A) operation, maintenance and equipment replacement costs of the power projects; (B) debt service costs of the power projects (associated with revenue bond financing); (C) safety inspection and investigations of the power projects by the Authority; and (D) annual costs of the power cost assistance program. The wholesale cost of energy from the State system would be based upon contracted sales and conservative estimates of sales for the State system since low water years or equipment failures could decrease the energy sales in any year below the average annual energy generation for the system. In addition, system losses in transmission and distribution of energy make the average annual system energy available for sales less than the average annual generation of the system.

Representative Hugh Malone
June 2, 1981
Page Two

Assuming that this section of the bill for rate setting takes effect in 1992 and that system sales are estimated to be 2.5 billion kwh's, revenue requirements would be divided by kwh sales to produce the system wholesale rate of energy. Assuming that revenue requirements are \$30 million for (A), \$25 million for (B), \$2 million for (C), and \$68 million for (D), the wholesale cost/kwh would be $\$125.00 \times 10^6 / 2.5 \times 10^9$ or 5¢/kwh.

I am sure you appreciate and understand that what is presented simplistically with rough estimates here would be presented in great detail with hard data if the program was implemented.

Please let me know if you need further explanation of how rates may be established under SB25.

June 4, 1981

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To: Representative Oral Freeman
Vice-Chairman, House Finance Committee

From: Arlon R. Tussing

LEGISLATION ON ELECTRIC POWER PROJECT FINANCING
AND COST ASSISTANCE: SUMMARY OF JUNE 2 TESTIMONY

I did not prepare a statement in advance of my appearance before the House Finance Committee on June 2. The following is a non-verbatim summary of the points raised in my oral statement and in questioning by Committee members.

1. Hydropower in Alaska is not necessarily cheap.

The Susitna project and most of the projects listed in SB 26 have higher estimated costs per kilowatt of capacity than the actual costs of recently completed nuclear plants in the lower 48. Cost-overruns are likely, and many of the projects will be underutilized in their early years, so that the actual cost per kilowatt actually generated will be very high indeed.

2. Hydropower is the best generating alternative in Alaska because (but only where) it is cheaper than thermal alternatives.

In most cases, the very high initial construction costs of hydro in Alaska will be justified because (1) a renewable energy source keeps operating costs very low, and (2) the plant has a very long life. Not every project listed in SB 26, however, will generate the amount of electricity that is needed more cheaply than thermal alternatives, or more cheaply than any other renewable-resource alternative.

Susitna may be the lowest-cost long-term alternative for the Railbelt, but that is not obvious today. Anchorage now has the lowest-priced thermally-generated power in the whole world (except perhaps Kuwait), because of low-cost natural gas. Alaska has vast natural-gas reserves, and gas prices would have to be increased several-fold and keep rising to make Susitna power cheaper. [Battelle is now investigating this question for the State. Also see Gregg Erickson's report to the House Research Agency.]

3. The lowest-cost long-term generating alternatives should be chosen regardless of the source and method of financing.

Alaska's existing procedures for power-project evaluation (in AS 44.56.180) are among the most businesslike and objective in the nation, yet leave the final decision on project funding to the Legislature. There is no compelling reason to change them.

SB 25 (in both its Senate version and the House Resources Committee version) make project-selection and ratemaking procedures political from the very beginning, and SB 26 (in both versions) short-circuits the established evaluation and review procedures. Together, the two Bills imply that the State will choose and fund projects without regard to whether they are really the lowest-cost alternatives. ["Don't confuse me with facts."] The Bills also invite future Legislatures to change the project-selection, financing, and ratemaking rules again and again and again.

4. Conventional financing and ratemaking arrangements exaggerate the costs of hydropower and obscure its benefits.

Conventional financing and ratemaking arrangements give a very heavy "front-end load" to the price of electricity generated by capital-intensive technologies -- notably hydro but also nuclear. Rates tend to be much too high in the early years and much too low later. The reasons that rates to consumers are distorted include:

(1) straight-line amortization of debt principal (which means that interest payments are very high at the beginning, and decline over the life of the project);

(2) the excess "debt-service coverage" required by lenders, which raises rates by 25 to 50 percent above actual principal and interest-payment needs,

(3) high market interest rates that are largely payments in advance for future inflation (True interest is only 2-4 percent; the remainder of the market rate only compensates the bond-buyers for the fact that inflation shrinks the value of their principal.); and

(4) a penalty for under-utilization of the project's capacity in its early years. (The same annual debt-service payments are spread over a smaller number of kilowatt-hours.)

As a result, an Alaska hydropower project whose average power cost over 25 years of service was only 7 cents per kilowatt-hour might require rates of 40 to 50 cents in its first year of service. These rates might decline to as low as 4 cents after 25 years. (This would be equal to only about 0.4 cents in the year-one dollars, if the long-term inflation rate were 10 percent.) [For a further explanation of the front-end load, its causes, and possible remedies, see my memorandum to Governor Hammond, "A New Approach to Electric Power Project Financing" (November 10, 1981).]

Under these circumstances the rates would probably begin at levels much higher than the thermally-generated status quo, and make the project very unattractive to consumers. Lenders would doubt whether the utility could actually levy and collect high enough bills to pay principal and interest, and thus the project might be unfinanceable.

If the project were completed anyway, unrealistically low rates in later years would encourage homeowners and industry to consume electricity as if these rates reflected the real cost of electricity, only to find that their bills suddenly had to increase by two, four, or even ten or more times, once the project's capacity was used up, because new projects would have to be built at new inflated prices, once more with a front-end-loaded debt-service schedule. (This is a pretty close description of what is happening now in the Pacific Northwest.)

5. Reasonable rates for hydropower do not require any State subsidy.

Wherever a large hydro project in Alaska is actually the lowest-cost source of power in the long run, "rate restructuring" can bring consumer electric rates down to reasonable levels, without any subsidy in the form of capital grants, low-interest loans, or power-cost assistance payments. Rate restructuring here means drastically reducing the front-end load in electricity prices by levelizing the project's debt-service (or return to equity) in inflation-adjusted dollars, over the term of its financing (e.g., 25 years).

In the example given in point 4 above, rates would ordinarily start at, say, 45 cents per kilowatt-hour and decline to 4 cents after 25 years, but restructuring would ideally allow them to start at 7 cents and escalate with inflation, so that the first-year and 25th-year price would be the same low constant-dollar average cost. In practice, restructuring would be incomplete, so that rates might start at about 10 cents and fall to 5 cents (in year-one dollars), as the project's generating capacity was fully used.

Beginning in mid-1980, the Governor's office (and its consultants, of which I was one) and the Alaska Power Authority, explored several rate-restructuring arrangements that would have helped local utilities finance their own hydro projects and reduced the initial rates for power from these projects to reasonable levels.

[One of these plans was set out in my November 10, 1980, memorandum cited above. Another memorandum to the Governor, "Power Project Financing Alternatives" (January 23, 1981) compares some of the different approaches, and a third paper, "Putting Various Hydropower Cost Factors into Their Proper Perspective," (February 26, 1981) shows that differences in financial strategies and interest rates tend to have less influence on the actual cost of electricity than non-financial factors such as project selection; construction-cost overruns; completion, licensing and startup delays; engineering design quality; and contractor performance.]

The plan that the Governor finally proposed to the Legislature was a reasonable compromise among these plans but it had three big faults: (1) It was not finalized until after influential Legislators had firmly committed themselves to other approaches; (2) it was too complicated; and (3) the Governor has not supported his own plan firmly or consistently.

6. State equity grants and statewide "postage-stamp" rates tend to encourage (1) bad project selection and (2) wasteful electricity consumption.

If someone else is paying the bill, communities and the utilities that serve them will ignore real costs per kilowatt-hour, and seek the biggest conceivable projects for their construction payrolls, for the prestige of having a big project, and in the hope that "cheap" power (no matter how false that cheapness is) will attract industry.

A statewide postage-stamp rate would also eliminate the incentive of energy-intensive industry to locate where power costs were truly lowest. (Actually, there are only two industries that decide where to locate their plants on the basis of electricity prices — uranium refining and primary aluminum manufacturing.)

If someone else is paying the bill, utilities have no incentive to operate efficiently, and consumers have no incentive to conserve energy. They will use electrical resistance heat, for example, even where oil, gas, coal, or wood is cheaper and, indeed, even where oil, gas, or coal is used to generate the electricity at less than half the efficiency of burning these fuels directly.

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7. There is a straightforward way (a) To finance the lowest-cost electrical generating project in each community or service area, (b) To assure reasonable electric rates beginning in each project's first year of service, (c) To preserve the right project-selection and energy-conservation incentives, (d) To protect the State's investment from inflation, and (e) Eventually to recover for the State treasury the original value of its construction-cost assistance.

The way to reconcile these goals is amazingly simple, and fits easily into either the existing law or a modified SB 25. The State would charge each utility that received a state construction grant, or which distributed electricity from an Alaska Power Authority project, an annual charge for the use of its capital equal to —

3 percent of the value of the State's investment in any hydro project (as adjusted for changes in the value of money);

5 percent of the (adjusted) value of the State's investment in any coal-fired steam plant; and

6.5 percent of the (adjusted) value of the State's investment in any gas-turbine or diesel generator.

Under this arrangement, rates could begin very low, and they would always stay low because fixed costs would never rise more rapidly than general inflation. For hydro, the first year's charges could be as low as one-sixth of the rates that would be dictated by conventional financing and ratemaking methods. (3 percent of the project's fixed cost as against 18.75 percent [3 percent depreciation plus 12 percent interest plus 3.75 percent excess coverage]).

An annual return of 3 percent on the inflation-adjusted value of the State's investment in hydro means that consumers will get the use of the money for 33-1/3 years without any real interest charge. At the same time, however, the State's investment would be totally protected from erosion because of inflation.

A 5-percent return on any State investment in coal-fired steam plants means that consumers will use the money free of real interest for 20 years, and that the State would get back the entire value of its investment, without reduction by inflation, over that period. Likewise, the 6.5-percent return on any State investment in gas and oil-fired facilities means the State's outlay will be repaid in 15.4 years. These different rates (1) reflect the longer economic life of hydro plants over steam turbines and of steam plants over oil and gas-fired generators, and (2) directly express the Legislature's preference for renewable energy.

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8. There are ways by which the State can lower electric costs to consumers even further --- ways that are (a) more equitable than capital grants or low-interest loans, and (b) do not distort project-selection decisions or create incentives for wasteful consumption.

The secret is for the State to pay for the full cost of generating the first (say) 300 kilowatt-hours per month for every residential electric customer in Alaska. This power-cost assistance would be completely separate from any program of state capital grants or construction loans, because everyone would get the same amount of power free, regardless of the technology used to generate the electricity, regardless whether or not the State had helped finance the generating plant, and regardless of the actual cost of its power.

State financial assistance would be directed to the technologies and projects with the lowest long-term generating cost for each community or service area. Consumers would pay rates based upon this (restructured) long-term cost for all consumption above the 300 kilowatt-hours per month. They would thus be encouraged to use electricity for heating where (and only where) it was truly the lowest-cost energy source, and industries heavily dependent on electricity would be encouraged to locate where (and only where) power costs were truly lowest.

NOTE: During the past year, I have served as a consultant to the Legislature, the Governor's office, and RURALCAP on electric power planning and financing issues. My statement here does not necessarily reflect the views of any of these agencies.

Also, I do not claim that any of the ideas presented here are original with me. Most of them have been around for many years under other names or in other applications. I want to state specifically that the Alaska Power Authority and its staff have been working imaginatively on the problem of rate restructuring for some time, and that nothing in my June 2 testimony was intended to diminish or discredit the Authority's efforts or the independent origin of its financing proposals.

Please notify Nancy Lord at Representative Brian Rogers' office on arrival of this telecopy. The original will be mailed to Representative Freeman.

PLEASE NOTE: THE FOLLOWING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT.



ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

Pouch Y, State Capitol
Juneau, Alaska 99811
(907) 465-3991

June 2, 1981

MEMORANDUM

TO: Members of the House Finance Committee

FROM: Alexander Hoke and Jack Kreinheden *JK*
Research Staff *AH*

RE: Analysis of SB 25 and SB 26 Hydro Legislation
Research Request No. 81-152

We have prepared two sets of computer printouts, which are enclosed, that summarize our analysis of the House Resources CS for SB 25 and the latest House Finance workdraft CS for SB 26. The first set of tables shows the expenditures and opportunity costs of these expenditures for power projects included in the SB 26 workdraft. In the second set, funding for construction of the Susitna project is added to demonstrate the effect of Susitna funding on other power projects and the total cost to the state for all projects.

The first printout of each set shows the total expenditures and opportunity costs for each power project over the period from FY 1982 to FY 2001, while the second printout presents a breakdown of these figures by each fiscal year in this period. The first column of each printout shows the planned expenditures for each project or fiscal year. It is important to note that these expenditures represent the full costs of each project, which for Bradley Lake and Solomon Gulch are higher than the amounts appropriated in SB 26.

Column 2 displays the net annualized cost, or opportunity cost, to the State of these expenditures, which we have calculated as the difference between the market rate of return available to the State (including payback of principal, as well as interest), and the actual return from the power projects. For example, the Bradley Lake project has a total cost in 1981 dollars of about \$200 million. The net annualized cost of this expenditure over the period from FY 1982 to FY 2001 in the noSusitna case is about \$155.4 million. This figure is the difference between the amount which the State could receive each year from a loan or bond investment at an 11 percent market rate of interest, and the amount which the State would receive from the "equity return" on hydro projects specified in the House Resources CS for SB 25.

The Resources CS for SB 25 provides that this equity rate of return is 5 percent through 1986. If the legislature has not appropriated at least \$5 billion to the power development fund by FY 1986, in other

words if Susitna or another major project is not constructed, the equity return to the State would increase from 5 percent to 10 percent, thereby reducing the opportunity costs to the State (but also increasing power prices).

If Susitna or another major project is developed, the opposite effect would occur. The bill states that when 500 megawatts of generation capacity have been developed, the return to the State from the power projects will be reduced from 5 percent to a level which covers only operations and maintenance costs and other expenses. The opportunity costs to the State would therefore increase at this time. We have assumed that the 500 megawatt threshold would be reached in 1993 in the Susitna case.

Column three of the printouts converts the net annualized cost to the State into present value terms (as of 1981). The discount rate used for this conversion is 10.24 percent, which is the average inflation rate in Anchorage over the past five years, according to the Consumer Price Index.

It is important to note that we have analyzed the opportunity costs of power project expenditures only through 2001. These opportunity costs would be substantially higher than those presented here if the analysis covered the full life of the power projects. Legislative Finance has done a long-term cost analysis which demonstrates this point.

The second set of three columns presents the information discussed above in terms of the expenditure and cost per power consumer to be served by each power project. In some cases where the actual number of consumers was not readily available, we used an estimate based on the average ratio of power customers to population for communities throughout the State. The third set of columns shows expenditures and costs on a per capita basis, based on the 1980 census population figures.

We have also enclosed five graphs which illustrate the information contained in the printouts. Figure 1 shows the per capita distribution of the SB 26 power project funding by election district in the no-Susitna case. Figure 2 shows the same distribution with Susitna construction funding included. In Figure 3, the expenditures, net annualized costs, and present value costs for the no-Susitna case are charted. This graph corresponds to the first three columns of the first computer printout. Figure 4 shows the same expenditures and costs with Susitna included, demonstrating the proportion of these costs which are attributable to the Susitna project.

Members of the House Finance Committee
June 2, 1981
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In Figure 5, we have projected the assistance available under the Power Cost Assistance program between FY 1982 and FY 1992 at several levels of power costs. This chart assumes a 5 percent annual increase in power costs, which is equivalent to a 10 percent annual increase in the cost of fuel.

Although not included with this memorandum, we have also prepared a set of tables which show the expenditures and costs for each project for each fiscal year. We can provide these tables if this more detailed breakdown is necessary.

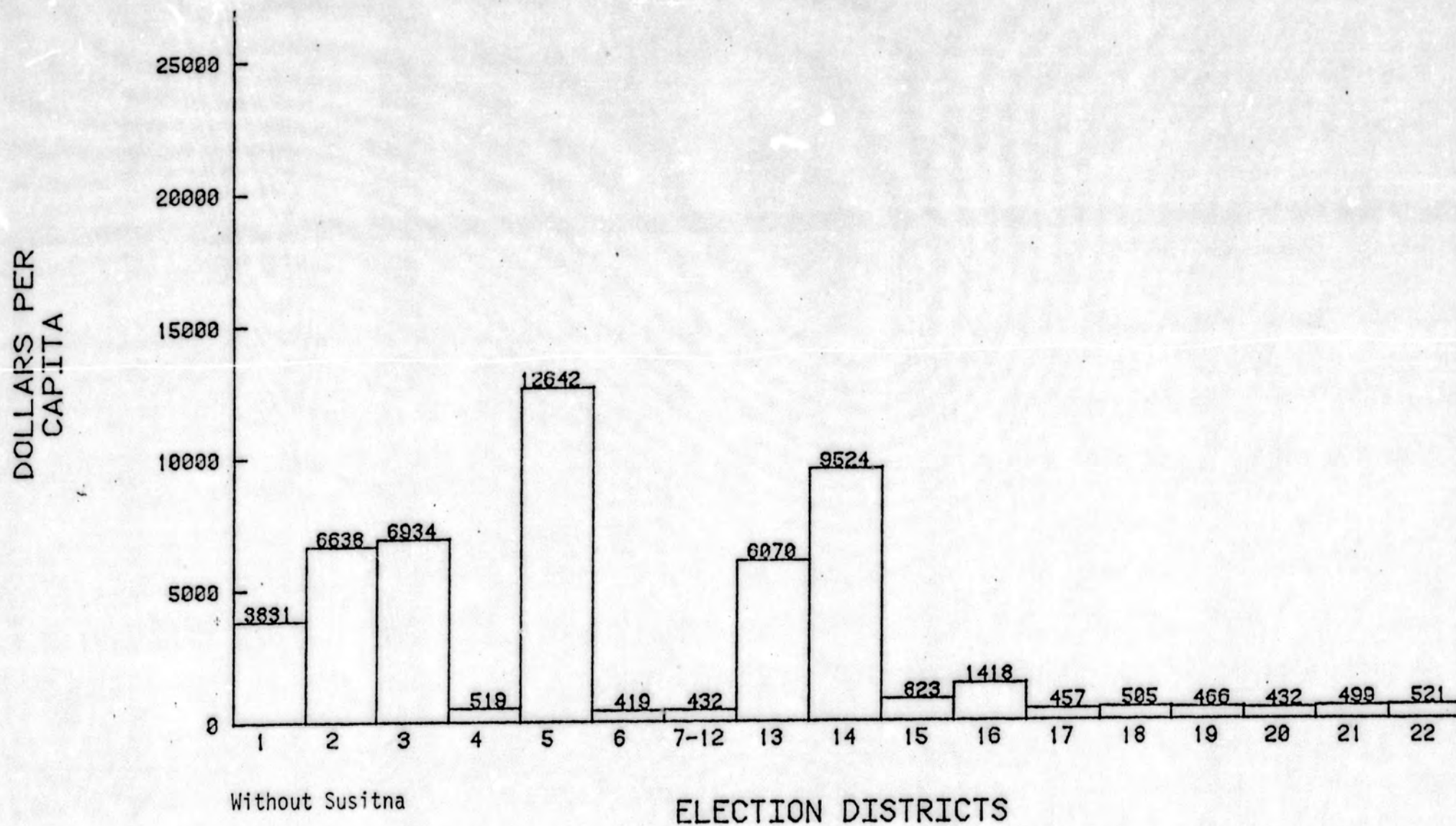
We hope this information is useful. If you have any questions or would like additional information, please let us know.

Enclosures

JK/bf

PER CAPITA DISTRIBUTION OF SB 26 POWER FUNDING (H. FINANCE DRAFT)

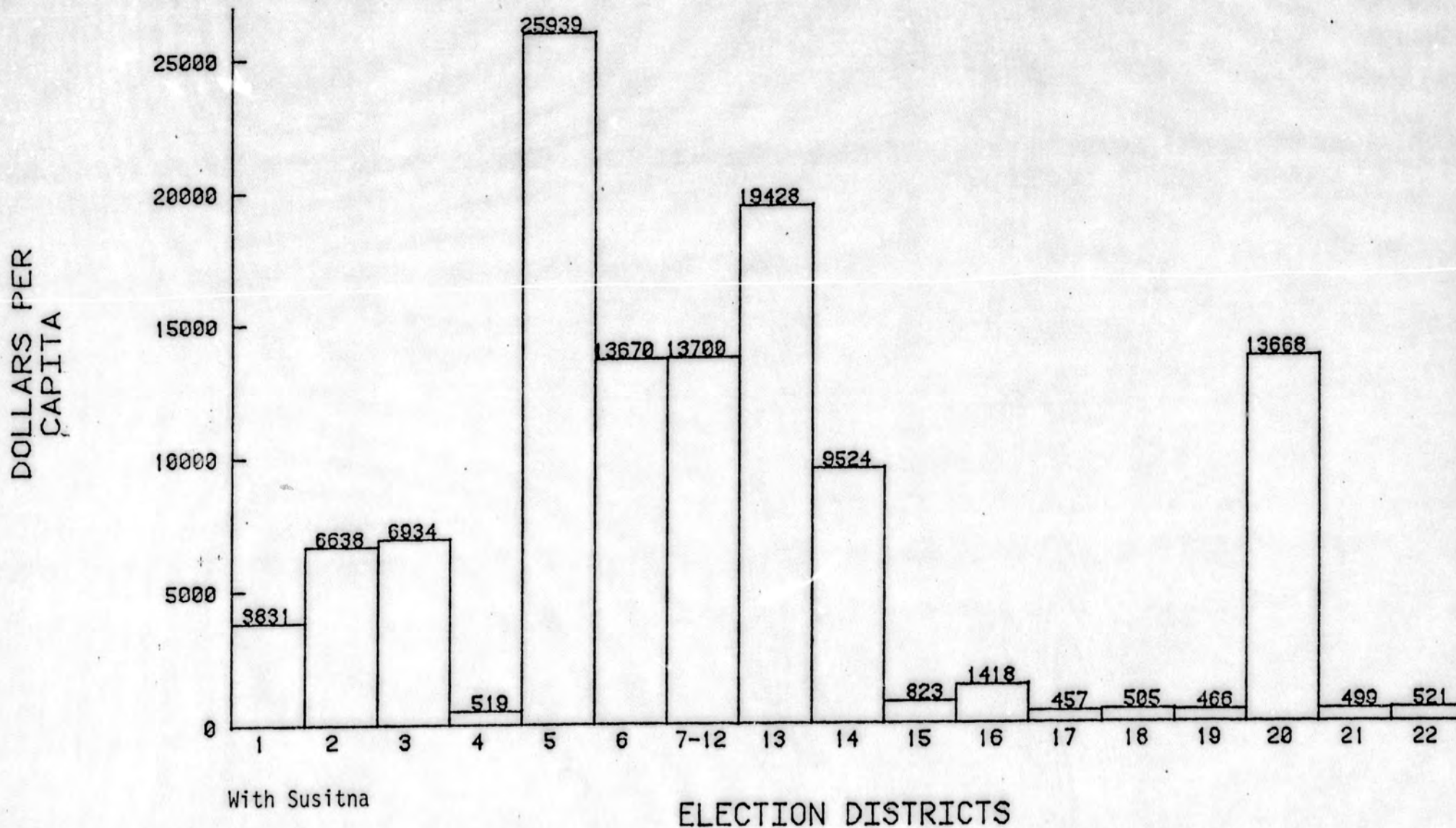
FIGURE 1



PREPARED BY:
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

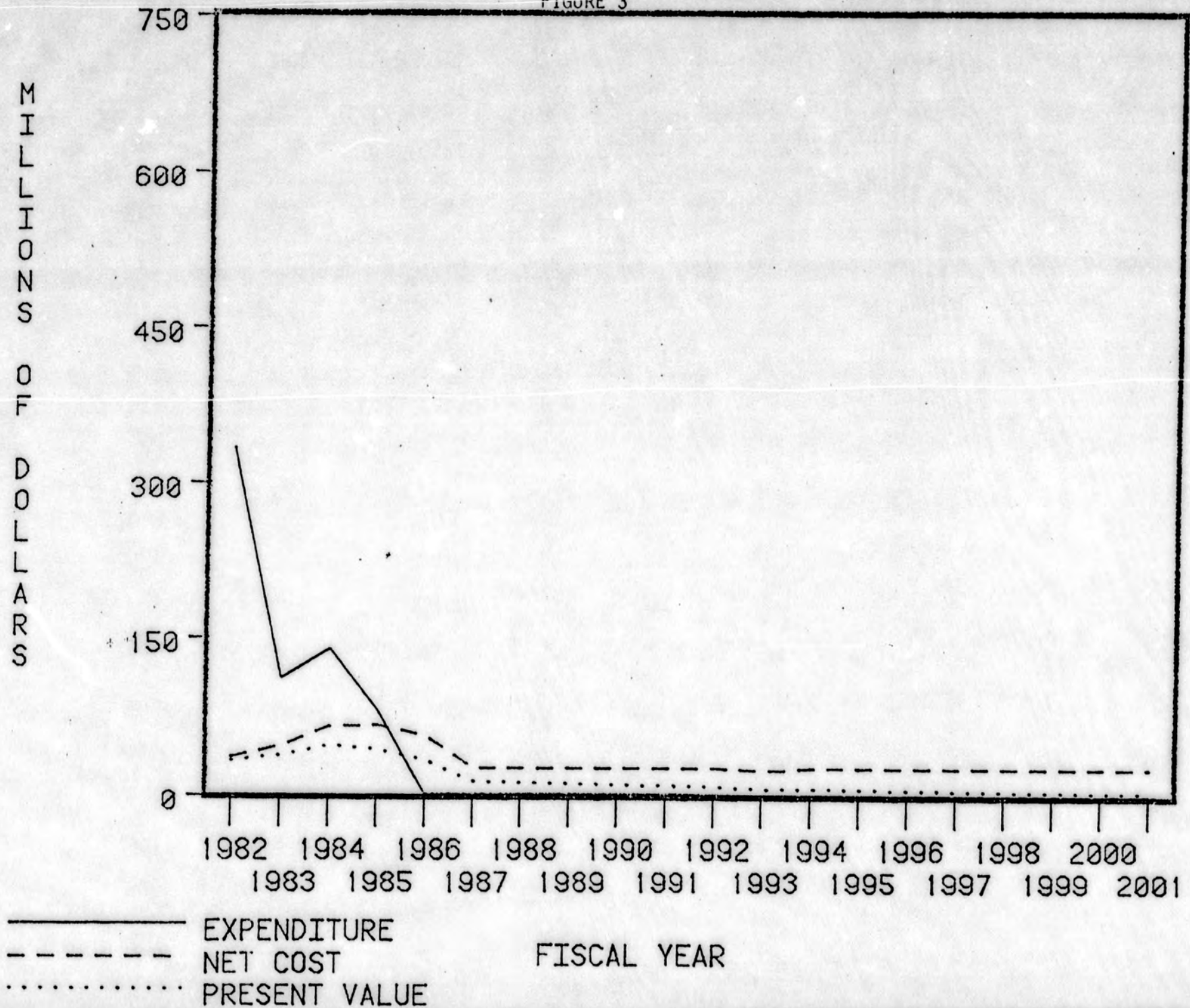
PER CAPITA DISTRIBUTION OF SB 26 POWER FUNDING (H. FINANCE DRAFT)

FIGURE 2



HYDRO FINANCING ANALYSIS - SB 26 (H. RESOURCES VERSION)
ASSUMES NO FUNDING FOR SUSITNA PROJECT

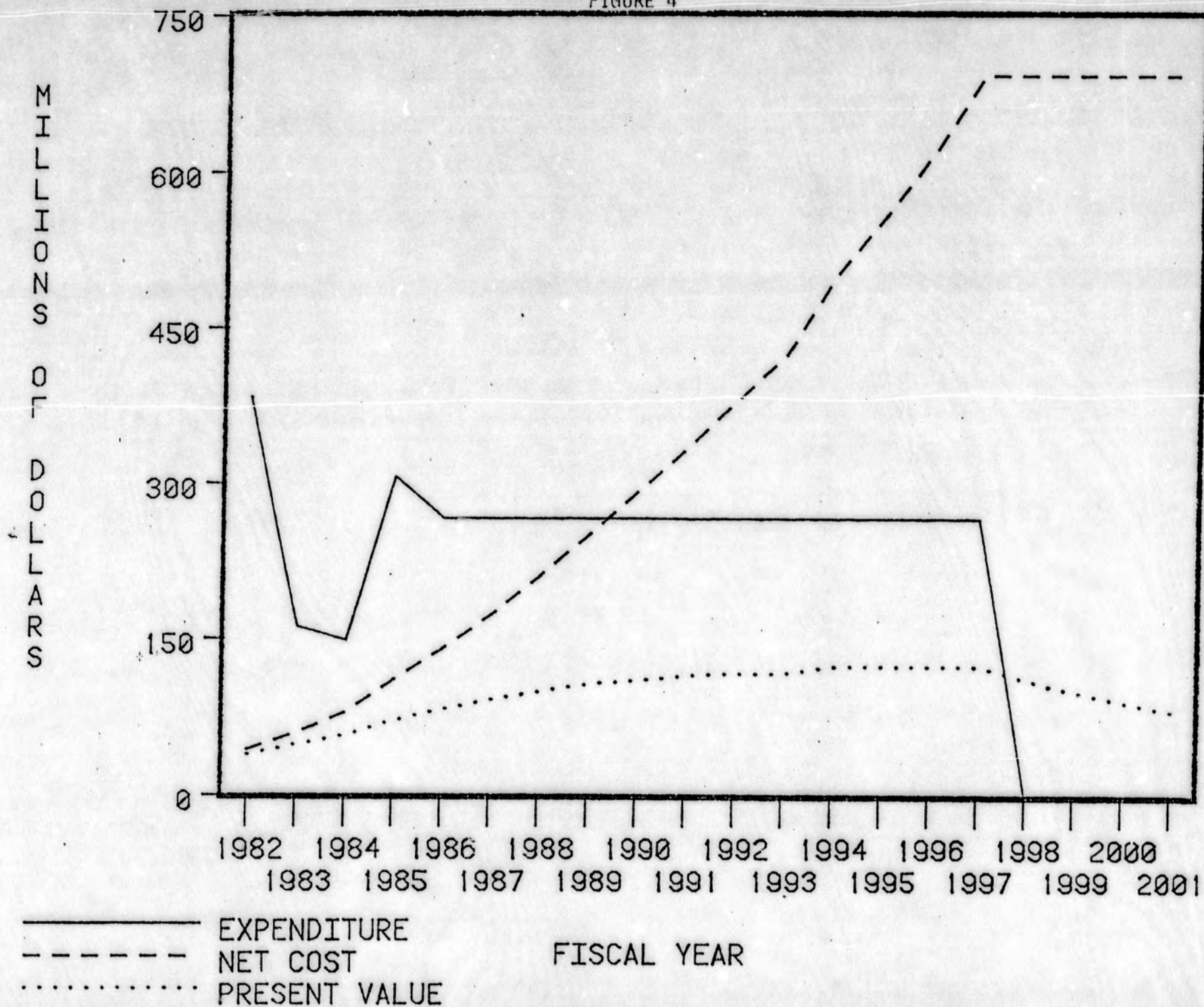
FIGURE 3



HYDRO FINANCING ANALYSIS - SB 26 (H. RESOURCES VERSION)

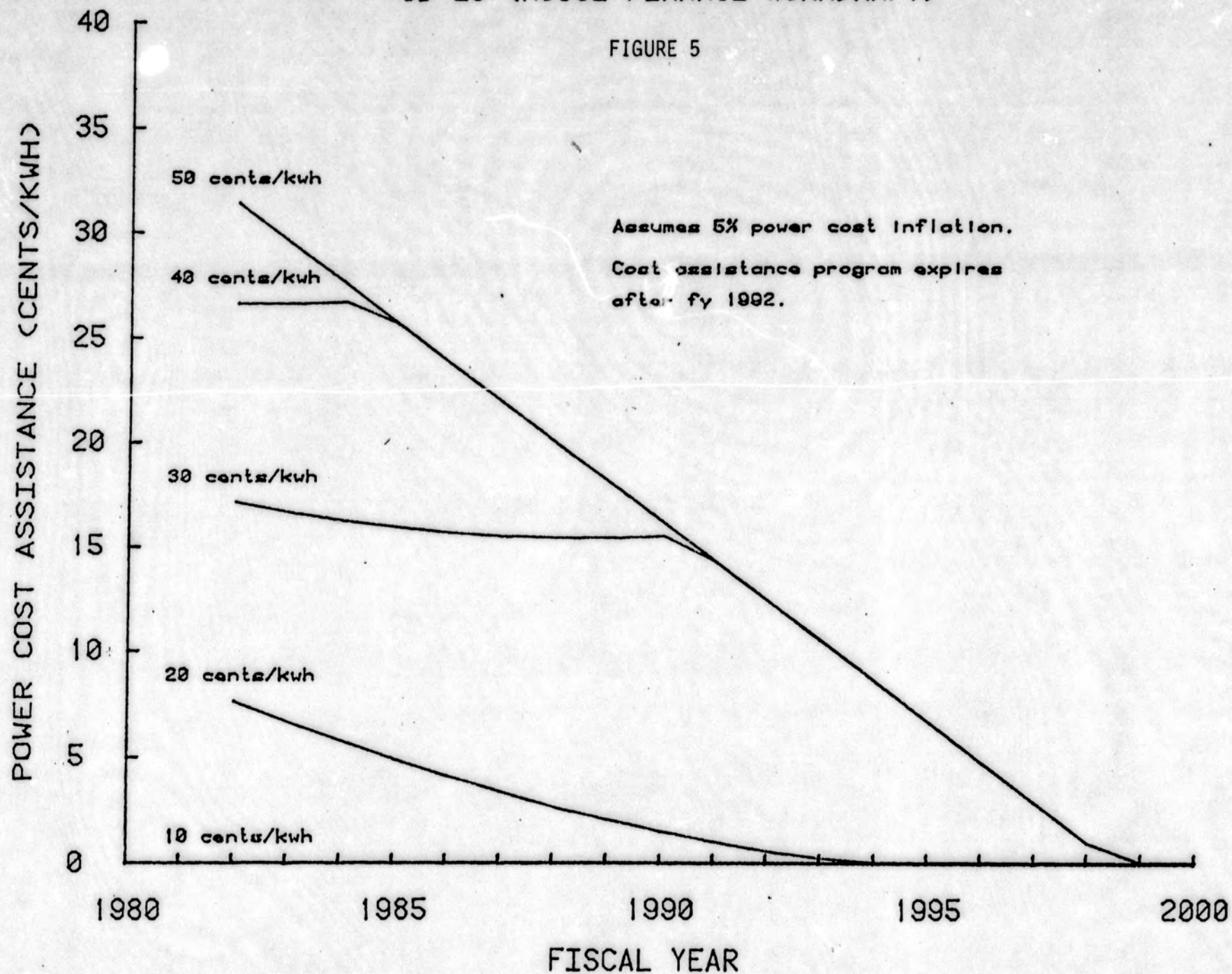
ASSUMES SUSITNA PROJECT FUNDING

FIGURE 4



ELECTRIC POWER COST ASSISTANCE LEGISLATION
SB 26 (HOUSE FINANCE WORKDRAFT)

FIGURE 5



HYDRO FINANCING ANALYSIS - SB 26 (HOUSE FINANCE DRAFT)

PARAMETERS USED IN ANALYSIS:

STATE RETURN ON HYDRO INVESTMENTS CONSIDERED AS CONVENTIONAL LOANS: 5 %

WITHOUT SUSITNA CONSTRUCTION

PREPARED BY
HOUSE RESEARCH AGENCY
JUNE 1, 1981

'EQUITY RETURN' STATE HYDRO INVESTMENTS ARE REPAID:

AT RATE OF 5% OF INITIAL EXPENDITURE UNTIL JULY 1, 1986

AT RATE OF 10% OF INITIAL EXPENDITURE THEREAFTER IF \$5 BILLION HAS NOT BEEN APPROPRIATED TO POWER FUND BY JULY 1, 1986

AT RATE SUFFICIENT TO OFFSET COSTS OF OPER., MAINT., AND EQUIP. REPLACEMENT AFTER TOTAL POWER PROJECT OUTPUT EXCEEDS 500 MEGAWATTS

ALTERNATIVE STATE MARKET RETURN ON INVESTMENTS: 11 %

INFLATION RATE 10.24 %

SUMMARY OF ALL POWER PROJECTS - SB 26 (HOUSE FINANCE DRAFT) TOTAL COST TO STATE FOR PERIOD 1992 TO 2001

(THOUSANDS OF DOLLARS)

PROJECT	EXPENDITURE	PRES VAL		EXPEND. PER CONS.	NET COST PER CONS.	PRES VAL		EXPEND. PER CAP	NET COST PER CAP	PRES VAL	
		ANNUALIZED STATE COST	ANNUALIZED STATE COST			NET COST PER CONS.	NET COST PER CONS.			NET COST PER CAP	NET COST PER CAP
BRADLEY LAKE	200,000	155,399	68,048	21,431	16,652	7,292	7,977	6,198	2,714		
PORT LIONS	1,400	1,136	596	19,718	16,001	8,402	6,511	5,284	2,774		
SOLIMON GULCH	68,000	55,182	28,977	33,431	27,130	14,246	11,333	9,197	4,829		
SWAN LAKE	53,000	44,985	22,972	14,021	11,901	6,077	4,670	3,964	2,024		
TERROR LAKE	81,500	67,905	33,944	23,397	23,660	11,827	8,218	6,847	3,422		
TYEE LAKE	40,000	33,399	16,736	19,569	16,340	8,188	6,522	5,445	2,728		
ANCH-FBNKS INTERTIE	76,000	68,529	36,846	746	673	361	280	253	136		
CRAIG-KLAWOCK INTERTIE	2,000	1,823	1,005	7,117	6,487	3,577	2,372	2,162	1,192		
TYEE-KAKE INTERTIE	5,800	5,111	2,716	32,222	28,395	15,093	10,603	9,343	4,966		
KODUK-SHUNGNAK LINE	200	152	76	2,325	1,770	886	778	592	296		
BARROW-ATKASOOK LINE	7,062	5,377	2,692	10,038	7,682	3,846	3,017	2,298	1,150		
GREEN LAKE	60,618	54,959	21,311	24,247	21,983	8,524	7,802	7,074	2,743		
RURAL WASTE HEAT	655	1,645	637	1,048	2,632	1,020	350	879	341		
BLACK BEAR LAKE	2,000	5,023	1,947	5,000	12,557	4,869	1,666	4,185	1,623		
CHESTER LAKE	1,000	2,511	973	3,030	7,610	2,951	1,011	2,539	984		
CHAKACHAMNA LAKE	1,000	2,511	973	9	24	9	3	9	3		
GRANT LAKE	1,000	2,511	973	1,628	4,090	1,586	542	1,363	528		
BETHEL REG. STUDY	1,000	2,511	973	778	1,956	758	285	716	278		
POWER CREEK	700	1,758	681	688	1,730	670	220	554	214		
SNETTISHAM	4,500	4,101	2,261	548	500	275	230	210	116		
SUSITNA STUDY	18,100	45,458	17,627	177	446	173	87	218	84		
TAZIMNA LAKE	2,000	5,023	1,947	5,714	14,351	5,565	1,846	4,638	1,798		
RURAL FEAS. STUDIES.	5,600	14,064	5,453	2,568	6,451	2,501	855	2,149	833		
RURAL VIL. RECONNAISSANCE	560	1,406	545	194	487	189	64	162	63		
HOGNAH-JUNEAU INTERTIE	996	907	500	3,112	2,837	1,564	1,471	1,341	739		
PELICAN	42	105	40	552	1,387	538	233	586	227		
LAKE ELVA	4,500	11,301	4,382	6,818	17,123	6,640	2,250	5,650	2,191		
NONDALTON TRANS. SYSTEM	961	2,413	935	17,472	43,882	17,016	5,652	14,197	5,505		
AELSP	7,000	6,575	2,845	952	894	386	400	376	162		
UNALASKA GEOTHERMAL	5,000	12,557	4,869	11,627	29,203	11,324	3,843	9,652	3,742		
VILLAGE ELECTRIFICATION	6,524	16,385	6,353	1,910	4,797	1,860	636	1,598	619		
AVEC POWER COST ASSIST.	10,134	21,503	6,322	2,815	5,973	1,756	723	1,535	451		
PORT LIONS COST ASSIST.	448	946	276	6,588	13,918	4,067	2,083	4,402	1,286		
KOTZEBUE COST ASSISTANCE	271	662	244	459	1,123	414	132	324	119		
TLINGIT-HAIDA COST ASSIST	1,741	3,802	1,174	2,408	5,258	1,624	824	1,801	556		
UNALAKISET COST ASSIST.	280	614	191	1,352	2,967	922	455	998	310		
MCCRATH COST ASSISTANCE	275	599	184	2,391	5,210	1,603	774	1,687	519		
NOME COST ASSISTANCE	148	368	140	195	486	185	65	162	61		
TOTALS	672,015	661,232	299,386	4,945	4,866	2,203	1,823	1,794	812		

HYDRO FINANCING ANALYSIS - SB 26 (HOUSE FINANCE DRAFT)

PARAMETERS USED IN ANALYSIS:

STATE RETURN ON HYDRO INVESTMENTS CONSIDERED AS CONVENTIONAL LOANS: 5 %

WITHOUT SUSITNA CONSTRUCTION

PREPARED BY
HOUSE RESEARCH AGENCY
JUNE 1, 1981

'EQUITY RETURN' STATE HYDRO INVESTMENTS ARE REPAID:

AT RATE OF 5% OF INITIAL EXPENDITURE UNTIL JULY 1, 1986

AT RATE OF 10% OF INITIAL EXPENDITURE THEREAFTER IF \$5 BILLION HAS NOT BEEN APPROPRIATED TO POWER FUND BY JULY 1, 1986

AT RATE SUFFICIENT TO OFFSET COSTS OF OPER., MAINT., AND EQUIP. REPLACEMENT AFTER TOTAL POWER PROJECT OUTPUT EXCEEDS 500 MEGAWATTS

ALTERNATIVE STATE MARKET RETURN ON INVESTMENTS: 11 %

INFLATION RATE 10.24 %

TOTAL NUMBER OF CONSUMERS SERVED BY HYDRO PROJECTS: 135875

TOTAL POPULATION SERVED BY HYDRO PROJECTS: 368442

SUMMARY OF ALL POWER PROJECTS AND COST ASSISTANCE PROGRAM SB 26 (HOUSE FINANCE DRAFT)

	EXPENDITURE	NET ANNUALIZED COST TO STATE	PRESENT VALUE NET ANNUALIZED COST TO STATE	EXPENDITURE PER CONSUMER	NET COST PER CONS.	PRESENT VALUE NET COST PER CONS.	EXPENDITURE PER CAPITA	NET COST PER CAPITA	PRESENT VALUE NET COST PER CAPITA
FY 1982	332,878,000	36,574,121	32,822,931	2,443	269	241	903	99	89
FY 1983	111,490,000	46,746,850	37,663,271	820	344	277	302	126	102
FY 1984	138,866,000	64,777,610	46,846,101	1,022	476	344	376	175	127
FY 1985	81,285,000	66,155,754	42,943,654	598	486	316	220	179	116
FY 1986	1,243,000	56,324,202	32,817,785	9	414	241	3	152	89
FY 1987	1,214,000	25,670,127	13,425,333	8	188	98	3	69	36
FY 1988	1,192,000	25,840,855	12,130,725	8	190	89	3	70	32
FY 1989	1,138,000	26,009,451	10,959,580	8	191	80	3	70	29
FY 1990	1,022,000	26,166,867	9,896,857	7	192	72	2	71	26
FY 1991	901,000	26,312,037	8,932,703	6	193	65	2	71	24
FY 1992	786,000	26,445,501	8,058,664	5	194	59	2	71	21
FY 1993	0	22,645,501	6,194,069	0	166	45	0	61	16
FY 1994	0	26,445,501	6,492,751	0	194	47	0	71	17
FY 1995	0	26,445,501	5,827,893	0	194	42	0	71	15
FY 1996	0	26,445,501	5,231,117	0	194	38	0	71	14
FY 1997	0	26,445,501	4,695,450	0	194	34	0	71	12
FY 1998	0	26,445,501	4,214,636	0	194	31	0	71	11
FY 1999	0	26,445,501	3,783,057	0	194	27	0	71	10
FY 2000	0	26,445,501	3,395,672	0	194	24	0	71	9
FY 2001	0	26,445,501	3,047,955	0	194	22	0	71	8
TOTALS	672,015,000	661,230,887	299,386,216	4,945	4,866	2,203	1,823	1,794	812

HYDRO FINANCING ANALYSIS - SB 26 (HOUSE FINANCE DRAFT)

PARAMETERS USED IN ANALYSIS:

STATE RETURN ON HYDRO INVESTMENTS CONSIDERED AS CONVENTIONAL LOANS: 5 %

WITH SUSITNA CONSTRUCTION

PREPARED BY
HOUSE RESEARCH AGENCY
JUNE 1, 1981

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ALTERNATIVE STATE MARKET RETURN ON INVESTMENTS: 11 %

INFLATION RATE 10.24 %

SUMMARY OF ALL POWER PROJECTS - SB 26 (HOUSE FINANCE DRAFT)

TOTAL COST TO STATE FOR PERIOD 1992 TO 2001

(THOUSANDS OF DOLLARS)

PROJECT	EXPENDITURE	PRES VAL		EXPEND. PER CONS.	NET COST PER CONS.	PRES VAL		EXPEND. PER CAP	NET COST PER CAP	PRES VAL	
		ANNUALIZED STATE COST	ANNUALIZED STATE COST			NET COST PER CONS.	NET COST PER CAP			NET COST PER CAP	NET COST PER CAP
SUSITNA CONSTRUCTION	3,600,000	6,520,942	1,520,049	35,357	64,045	14,929	13,293	24,079	5,612		
BRADLEY LAKE	200,000	385,399	122,893	21,431	41,298	13,169	7,977	15,371	4,901		
PORT LIONS	1,400	2,746	980	19,718	38,677	13,809	6,511	12,772	4,560		
SOLOMON GULCH	68,000	133,382	47,624	33,431	65,576	23,414	11,333	22,230	7,937		
SWAN LAKE	53,000	105,935	37,506	14,021	28,025	9,922	4,670	9,336	3,305		
TERROR LAKE	81,500	161,630	56,293	28,397	56,317	19,614	8,218	16,298	5,676		
TYEE LAKE	40,000	79,399	27,705	19,569	38,845	13,554	6,522	12,946	4,517		
ANCH-FBNKS INTERTIE	76,000	155,929	57,637	746	1,531	566	280	575	213		
CRAIG-KLAWOCK INTERTIE	2,000	4,123	1,553	7,117	14,672	5,528	2,372	4,890	1,842		
TYEE-KAKE INTERTIE	5,800	11,781	4,307	32,222	65,450	23,929	10,603	21,537	7,874		
KOBUK-SHUNGNAK LINE	200	382	131	2,325	4,445	1,524	778	1,487	510		
BARROW-ATKASOOK LINE	7,062	13,499	4,629	10,088	19,284	6,612	3,017	5,768	1,978		
GREEN LAKE	60,618	54,959	21,311	24,247	21,983	8,524	7,802	7,074	2,743		
RURAL WASTE HEAT	655	1,645	637	1,048	2,632	1,020	350	879	341		
BLACK BEAR LAKE	2,000	5,023	1,947	5,000	12,557	4,869	1,666	4,185	1,623		
CHESTER LAKE	1,000	2,511	973	3,030	7,610	2,951	1,011	2,539	984		
CHAKACHAMNA LAKE	1,000	2,511	973	9	24	9	3	9	3		
GRANT LAKE	1,000	2,511	973	1,628	4,090	1,586	542	1,363	528		
BETHEL RFG. STUDY	1,000	2,511	973	778	1,956	758	235	716	278		
POWER CREEK	700	1,758	681	688	1,730	670	220	554	214		
SNETTISHAM	4,500	9,276	3,495	548	1,131	426	230	476	179		
SUSITNA STUDY	18,100	45,458	17,627	177	446	173	87	218	84		
TAZIMNA LAKE	2,000	5,023	1,947	5,714	14,351	5,565	1,846	4,638	1,798		
RURAL FEAS. STUDIES.	5,600	14,064	5,453	2,568	6,451	2,501	855	2,149	833		
RURAL VIL. RECONNAISSANCE	560	1,406	545	194	487	189	64	162	63		
HODNAH-JUNEAU INTERTIE	936	2,053	773	3,112	6,416	2,417	1,471	3,032	1,142		
PELICAN	42	105	40	552	1,387	538	233	586	227		
LAKE ELVA	4,500	11,301	4,382	6,818	17,123	6,640	2,250	5,650	2,191		
NONDALTON TRANS. SYSTEM	961	2,413	935	17,472	43,882	17,016	5,652	14,197	5,505		
AEL&P	7,000	6,575	2,845	952	894	386	400	376	162		
UNALASKA GEOTHERMAL	5,000	12,557	4,869	11,627	29,203	11,324	3,843	9,652	3,742		
VILLAGE ELECTRIFICATION	6,524	16,385	6,353	1,910	4,797	1,860	636	1,598	619		
AVEC POWER COST ASSIST.	10,134	21,503	6,322	2,815	5,973	1,756	723	1,535	451		
PORT LIONS COST ASSIST.	448	946	276	6,588	13,918	4,067	2,083	4,402	1,286		
KOTZEBUE COST ASSISTANCE	271	662	244	459	1,123	414	132	324	119		
TLINGIT-HAIDA COST ASSIST	1,741	3,802	1,174	2,408	5,258	1,624	824	1,801	556		
UNALAKLEET COST ASSIST.	280	614	191	1,352	2,967	922	455	998	310		
MCCRATH COST ASSISTANCE	275	599	184	2,391	5,210	1,603	774	1,687	519		
NOME COST ASSISTANCE	148	368	140	195	486	185	65	162	61		
TOTALS	4,272,015	7,803,702	1,967,640	31,440	57,432	14,481	11,594	21,180	5,340		

HYDRO FINANCING ANALYSIS - SB 26 (HOUSE FINANCE DRAFT)

PARAMETERS USED IN ANALYSIS:

WITH SUSITNA CONSTRUCTION

PREPARED BY
HOUSE RESEARCH AGENCY
JUNE 1, 1981

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TOTAL NUMBER OF CONSUMERS SERVED BY HYDRO PROJECTS: 135875

TOTAL POPULATION SERVED BY HYDRO PROJECTS: 363442

SUMMARY OF ALL POWER PROJECTS AND COST ASSISTANCE PROGRAM SB 26 (HOUSE FINANCE DRAFT)

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FY 1982	382,873,000	42,852,903	38,464,766	2,817	315	283	1,039	116	104
FY 1983	161,490,000	59,403,757	47,860,761	1,188	437	352	438	161	129
FY 1984	188,866,000	83,926,660	60,694,379	1,389	617	446	512	227	164
FY 1985	351,225,000	121,072,106	78,591,481	2,585	891	578	953	328	213
FY 1986	266,243,000	147,152,491	85,739,676	1,959	1,082	631	722	399	232
FY 1987	266,214,000	180,373,605	94,334,390	1,959	1,327	694	722	489	256
FY 1988	266,192,000	218,499,806	102,572,505	1,959	1,608	754	722	593	278
FY 1989	266,138,000	257,928,415	108,683,080	1,958	1,898	799	722	700	294
FY 1990	266,022,000	298,903,062	113,051,403	1,957	2,199	832	722	811	306
FY 1991	265,901,000	341,745,299	116,019,499	1,956	2,515	853	721	927	314
FY 1992	265,786,000	386,876,141	117,891,700	1,956	2,847	867	721	1,050	319
FY 1993	265,000,000	430,935,582	117,870,868	1,950	3,171	867	719	1,169	319
FY 1994	265,000,000	513,253,561	126,011,140	1,950	3,777	927	719	1,393	342
FY 1995	265,000,000	569,490,608	125,500,767	1,950	4,191	923	719	1,545	340
FY 1996	265,000,000	632,130,397	125,040,106	1,950	4,652	920	719	1,715	339
FY 1997	265,000,000	703,831,529	124,966,676	1,950	5,179	919	719	1,910	339
FY 1998	0	703,831,529	112,170,088	0	5,179	825	0	1,910	304
FY 1999	0	703,831,529	100,683,871	0	5,179	741	0	1,910	273
FY 2000	0	703,831,529	90,373,843	0	5,179	665	0	1,910	245
FY 2001	0	703,831,529	81,119,561	0	5,179	597	0	1,910	220
TOTALS	4,272,015,000	7,803,702,045	1,967,640,570	31,440	57,432	14,481	11,594	21,180	5,340

Mark



Alaska Regional Energy Association

327 Eagle Street P.O. Box 3-3908 Anchorage, Alaska 99501 (907) 279-2511

May 11, 1981

Members

Aleutian/Pribilof
Islands Association, Inc.

Bristol Bay Native
Association

Central Council - Tlingit
Haida Indians of Alaska

Cook Inlet Native
Association

Copper River Native
Association

Kawerak, Inc.

Kodiak Area Native
Association

Koyukon Development
Corporation

Mauneluk Association

The North Pacific Rim

North Slope Borough

Nunam
Kitlutsisti

Tanana Chiefs
Conference, Inc.

Upper Tanana
Development Corporation

Hugh Malone
Alaska State Legislature
Pouch V (MS 3100)
Juneau, Alaska 99811

Dear Representative Malone:

I am writing to express my concern on behalf of the Alaska Regional Energy Association (AREA) that rural as well as railbelt energy needs be addressed directly this session. Specifically, the AREA delegates representing the views of fourteen regional non-profit associations have established the passage of the provisions of CSSSHB 9 as their highest legislative priority. We are concerned that in the current legislative climate; that conservation, regional energy planning, village reconnaissance studies and appropriate technology which will afford rural Alaska a measure of energy self-reliance will be swept between the cracks.

Rural energy problems will not be solved by expanding energy bill paying subsidies as a long term solution. This will only aggravate the village dependence on transfer payment programs.

Although we feel that some form of power production cost assistance is warranted, we do not support it as the only solution to rural energy problems. We recommend that Power Production costs assistance not be a contingency within SB 25 and 26. This issue should be dealt with, separately.

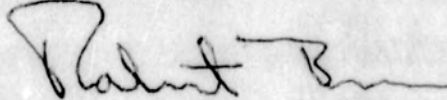
Further, we ask that the provisions of House Bill 9 be given at least equal weight to these bills (i.e. SB 25 and 26). These bills will have a major impact on Alaska's energy future we strongly urge that public hearings be held at regional centers around the state. Public input into decisions of this magnitude is absolutely essential. Hopefully, neither SB 25 nor 26

will pass the House until the Senate has approved the provisions for the aforementioned.

I and other AREA delegates will be available for testimony at any appropriate hearings. Please, notify us.

Thank you for your time and consideration.

Sincerely,

A handwritten signature in dark ink, appearing to read "Robert Brean", with a stylized flourish at the end.

Robert Brean, Chairman
Alaska Regional Energy Association

PLEASE NOTE: THE PRECEDING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT.

Jim Sarby

4/8/81

Gov's amendments tie large & small producers together

~~Some elements~~

Policy position - equity

Make grant, available to all power producers
(\$2500 per capita)

Market tests should be preserved

Debt financing w/restructured payback

Equity participation is available to alt. power producers
they can receive equity

but service areas must overlap (utility v. private)

Decision on who gets it will be made by
APUC

+ will be able to buy & sell power

— APH/APUC will award grants to most efficient producer

equity for
capital
costs
only

Would restructure ^{alt. energy} loan fund
up to \$100K

AIDA rev. bond rate

90% of project costs

75% of useful life - repayment schedule

(don't need
equity grant)

H13461

Co-generation — utility

equity can only pay for actual power
generation

1 /
2 → debt restructuring

Conservation/Weatherization - continue loan & audit program
reimbursement at 90% (committee page 107)

audit program should be unlimited

Weatherization - Alaska (adm. by dept)
 rain income limit
 audit fee, \$2200 ^{net} for weather.

Business loans would continue to handle loans / ins. for credit checks

① Gov can use veto + OBM to get \$2500 grant

② Split out feasibility study
 ③ get rid of authority → administration

④ administrative change

→ equity in incentives

STATE OF ALASKA

DEPARTMENT OF COMMERCE & ECONOMIC DEVELOPMENT

DIVISION OF ENERGY & POWER DEVELOPMENT

JAY S. HAMMOND
GOVERNOR

7TH FLOOR MACKAY BLDG.
338 DENALI STREET
ANCHORAGE, ALASKA 99501
PHONE: (907) 276-0508

April 23, 1981

Joyce Roloff
Legislative Information Office
Room 30, Capitol Bldg.
Juneau, AK 99811

Dear Ms. Roloff:

Per your request attached is a copy of the revised working paper, The Potential for Hydroelectric Power Meeting Alaska's Electrical Energy Demand Between 1980-2004. It should be definitely noted that this working paper is very rough in nature and based upon debatable assumptions and therefore, its conclusions are still preliminary and should not be used for more than a general indication of three possible scenarios. Due to a mathematical error contained in the initial document prepared for Representative Gardiner, this report has been revised.

Should you require any additional information, please do not hesitate to contact me.

Sincerely,

Clarissa M. Quinlan
Director

Enclosure:

cc: Charles Webber
Commissioner

CMQ:vlr

April 23, 1981

R-E-V-I-S-E-D

PRELIMINARY WORKING PAPER

The Potential for Hydroelectric Power Meeting
Alaska's Electrical Energy Demand Between
1980 & 2004

At the request of Representative Terry Gardiner, the Division of Energy & Power Development has prepared the attached information.

The demand and installed hydroelectric cost estimates are for illustrative purposes only and are not to be construed as representing final or official division estimates.

Included are very general comparisons of three energy demand scenarios representing high, medium and low growth rates. It was assumed (although not accurately) that all additional electric demand would be met by hydropower plants. A 5% inflationary factor was applied and all costs are reflected in 1981 dollars.

The application of a reserve margin was used only to illustrate its impact on total capacity and costs. An attempt was also made to be conservative in estimating the potential for substituting hydrogen-generated electricity for traditional heating fuels. For example, only portions (High 30%, Medium 20%, Low 10%) of anticipated new space heating requirements were assumed to substitute electricity for petroleum or natural gas fuels. No additional demand was assumed to be met through such a substitution for the present to the 1984 period.

Other fuel substitution potentials, such as electric cars and, in the long term, hydroelectric produced hydrogen as a substitute transportation, heating and cooking fuel were not included.

The very rough and preliminary nature of this document cannot be overstated. It is for illustration only. It does, however, point out the value for similar in-depth analysis on a regional level.

1979 Alaska Energy End-Use - Billion Btu's

Electricity	-	12,539.2891
Heating Fuel		
- Residential	-	20,949.1300
- Commercial	-	5,079.5400
Natural Gas (heating)	-	16,105.000

ASSUMPTIONS

° Average Annual Electrical Demand Growth Rate

	<u>1979-84</u>	<u>1985-89</u>	<u>1990-94</u>	<u>1995-99</u>	<u>2000-04</u>
High Demand*	14.2%	6.9%	6.8%	7.1%	3.3%
Medium Demand**	7.4	5.2	5.9	4.6	4.6
Low Demand	2.5	2.0	1.5	1.0	.5

* Alaska Power Administration 1978 - Railbelt High Demand

** Alaska Power Administration 1981 - Statewide Medium Growth

- ° All incremental electrical demand will be met by hydroelectric power.
- ° All cost estimates in 1981 dollars with 5% inflation rate.
- ° Space heating fuel substitution rate applied 30% for high, 20% for medium and 10% for low to new annual space heating demand projected at 2.4% which coincides with projected population increase.
- ° The use of an average reserve margin is not possible in a very preliminary statewide estimates such as this. The 15% reserve margin noted is only for illustrative purposes as a means of reflecting its impact on total costs.
- ° Load factor assumed 0.05.
- ° Energy conversion efficiencies = 100%
- ° Conversion Factor: Kwh = Btu x .000293018
- ° Cost per installed megawatt = \$2.0 million/MW

Existing Projects - 1979 Dollars Cost per Megawatt

Susitna	-	\$1.545 million/MW
Snettisham	-	\$.944
Green Lake	-	\$2.818
Swan Lake	-	\$3.895
Tyee	-	\$2.683
Solomom Gulch	-	\$2.666
Terror Lake	-	\$2.500

ELECTRICITY

	HIGH			MEDIUM			LOW		
	Increase Increment (Billions of Btu's/Yr)	New Capacity (MW)	Cost Billions	Increase Increment (Billions of Btu's/Yr)	New Capacity (MW)	Cost Billions	Increase Increment (Billions of Btu's/Yr)	New Capacity (MW)	Cost Billions
1979-1984	11,816	790.4	\$2.02	5,379	359.8	\$0.92	1,648	110.2	\$0.28
1985-1989	9,644	645.1	2.10	5,169	345.8	1.13	1,477	98.8	0.32
1990-1994	13,242	885.8	3.68	7,663	512.6	2.13	1,210	80.9	0.34
1995-1999	19,327	1,292.9	6.86	7,754	518.7	2.75	861	57.6	0.31
2000-2004	11,734	784.9	5.32	9,706	649.3	4.40	448	30.0	0.20
		4,399.1	\$19.98		2,386.2	\$11.33		377.5	\$1.45
	15% Reserve Margin								
		5,059.0	22.98		2,744.1	13.03		434.1	1.67
	20% Reserve Margin								
		5,278.9	23.98		2,863.4	13.60		453.0	1.74

SPACE HEATING

	HIGH			MEDIUM			LOW		
	Increase Increment (Billions of Btu's/Yr)	New Capacity (MW)	Cost Billions	Increase Increment (Billions of Btu's/Yr)	New Capacity (MW)	Cost Billions	Increase Increment (Billions of Btu's/Yr)	New Capacity (MW)	Cost Billions
1979-1984	-	-	-	-	-	-	-	-	-
1985-1989	1,834.26	122.70	\$0.40	1,222.84	81.80	\$0.27	611.4	40.90	\$0.13
1990-1994	2,065.20	138.15	0.57	1,376.80	92.10	0.38	688.40	45.05	0.19
1995-1999	2,325.21	155.54	0.83	1,550.14	103.70	0.55	775.07	51.85	0.28
2000-2004	2,617.95	175.13	1.19	1,745.30	116.75	0.79	872.65	58.38	0.40
		591.52	\$2.29		394.35	\$1.99		197.18	\$1.00

YEAR 2004

	HIGH		MEDIUM		LOW	
	Add'l Capacity (MW)	Installed Cost (\$Billion)	Add'l Capacity (MW)	Installed Cost (\$Billion)	Add'l Capacity (MW)	Installed Cost (\$Billion)
Traditional Electricity	4,399.1	\$19.98	2,386.2	\$11.33	377.5	\$1.45
Space Heating Substitution	591.52	2.99	394.35	1.99	197.18	1.00
Total	4,990.62	\$22.97	2,780.55	\$13.32	574.68	\$2.82
Total w/15% Reserve	5,739.21	\$26.42	3,197.63	\$15.32	660.88	\$2.82

April 23, 1981

R-E-V-I-S-E-D

PRELIMINARY WORKING PAPER

The Potential for Hydroelectric Power Meeting
Alaska's Electrical Energy Demand Between
1980 & 2004

At the request of Representative Terry Gardiner, the Division of Energy & Power Development has prepared the attached information.

The demand and installed hydroelectric cost estimates are for illustrative purposes only and are not to be construed as representing final or official division estimates.

Included are very general comparisons of three energy demand scenarios representing high, medium and low growth rates. It was assumed (although not accurately) that all additional electric demand would be met by hydropower plants. A 5% inflationary factor was applied and all costs are reflected in 1981 dollars.

The application of a reserve margin was used only to illustrate its impact on total capacity and costs. An attempt was also made to be conservative in estimating the potential for substituting hydrogen-generated electricity for traditional heating fuels. For example, only portions (High 30%, Medium 20%, Low 10%) of anticipated new space heating requirements were assumed to substitute electricity for petroleum or natural gas fuels. No additional demand was assumed to be met through such a substitution for the present to the 1984 period.

Other fuel substitution potentials, such as electric cars and, in the long term, hydroelectric produced hydrogen as a substitute transportation, heating and cooking fuel were not included.

The very rough and preliminary nature of this document cannot be overstated. It is for illustration only. It does, however, point out the value for similar in-depth analysis on a regional level.

1979 Alaska Energy End-Use - Billion Btu's

Electricity	-	12,539.2891
Heating Fuel		
- Residential	-	20,949.1300
- Commercial	-	5,079.5400
Natural Gas (heating)	-	16,105.000

Original sponsors: Kerittula, Dankworth,
Ziegler, et al

IN THE SENATE

BY THE RESOURCES COMMITTEE

HOUSE CS FOR CS FOR SPONSOR SUBSTITUTE FOR SENATE BILL NO. 25 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWELFTH LEGISLATURE - FIRST SESSION

A BILL

For an Act entitled: "An Act relating to the Alaska Power Authority, amending the Alaska Power Authority Act, and providing for the investment of money appropriated for power projects of the Alaska Power Authority; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. AS 44.83 is amended by adding new sections to read:

ARTICLE 8. ENERGY PROGRAM FOR ALASKA.

Sec. 44.83.400. PROGRAM ESTABLISHED. (a) The energy program for Alaska is established. The program shall be administered by the authority.

(b) The energy program for Alaska is a program by which the authority may acquire or construct power projects with money appropriated by the legislature to the power development fund established in AS 44.83.410. A power project may be acquired or constructed as part of the energy program for Alaska only if the project is submitted to and approved by the legislature in accordance with procedures set out in AS 44.83.177 - 44.83.187.

Sec. 44.83.410. POWER DEVELOPMENT FUND ESTABLISHED. (a) A power development fund is established in the Alaska Power Authority to carry out the purposes of the energy program for Alaska (AS 44.83.400 - 44.83.500).

(b) The fund includes

~~all~~ all money appropriated to it by the legislature, ^{and}

~~(2) interest earned by investment of money in the fund by the Department of Revenue.~~

Sec. 44.83.420. USE OF FUND BALANCE. (a) The fund may be used by the authority to provide money for

(1) reconnaissance and feasibility studies and power project finance plans prepared under AS 44.83.177 - 44.83.181;

(2) the cost of a power project, including but not limited to costs of acquiring necessary licenses, preparing engineering designs obtaining land, and constructing the power project; and

(3) the power production cost assistance fund (AS 44.83.162)

(b) Money in the fund may be used under (a) of this section only for a power project which

(1) meets the revenue requirements of AS 44.83.470; and

(2) operates or will operate

(A) on renewable energy resources, including but not limited to hydroelectric power, wind, biomass, tidal or solar energy, or a method which uses temperature differentials or other physical properties of the ocean;

(B) on coal or peat;

(C) on energy derived from waste heat from thermal generating plants; or

(D) on fossil fuel if none of the other resources or fuels listed in this subsection are economically feasible.

Sec. 44.83.430. INVESTMENT OF FUND. The Department of Revenue shall invest ^{money in} ~~the balance of the fund which exceeds the amount the~~ authority determines is necessary to meet requirements of AS 44.83.420 during the current fiscal year. An investment by the Department of Revenue under this subsection shall be made in accordance with AS 37.10.070 and 37.10.075. The Department of Revenue shall provide money in the fund to the authority

1 Sec. 44.83.440. ALLOTMENT TO PROJECTS. (a) The authority shall
2 maintain records of power project allocations from the fund for each
3 power project

4 (1) approved in accordance with AS 44.83.185; and

5 (2) for which an allocation is made from an appropriation
6 made by the legislature without specifying an appropriation to a
7 project.

8 (b) Income earned from investment of money appropriated to the
9 fund shall be ~~deposited in the general fund and may be annually~~
10 ~~appropriated to the fund by the legislature.~~
11 ~~appropriations have been made by law. The allotment shall be based on~~
12 ~~the amount of investment income earned during each state fiscal year~~
13 ~~during or after which the legislature appropriated money to the fund.~~
14 ~~An allotment of income under this subsection shall be made to each~~
15 ~~power project for which a specific appropriation has been made in~~
16 ~~proportion to the unexpended amount appropriated for that project as a~~
17 ~~percentage of the total amount appropriated by the legislature to the~~
18 ~~fund.~~

19 Sec. 44.83.450. REAPPROPRIATION OF FUND BALANCE. (a) If a power
20 project designated by the legislature by law is not constructed, the
21 amount appropriated to it may be reappropriated to other power projects
22 by the legislature.

23 (b) The legislature may reappropriate money under (a) of this
24 section only for a power project which is economically feasible under
25 AS 44.83.181(b) and only if the project will serve the market area that
26 would have been served by the power project designated by the legisla-
27 ture and not constructed.

28 Sec. 44.83.460. LAPSE OF EXCESS APPROPRIATIONS. If at the end of
29 construction of a power project appropriations for the power project
exceed the amount required for construction of it, the excess lapses

(4) the rate of return specified in AS 44.83.490.

into the general fund.

Sec. 44.83.470. REVENUE REQUIREMENTS. The authority may not use money in the fund for a power project unless, ^{after making a feasibility study under} the authority determines that, after construction, operation of the power project will provide revenue sufficient to cover

(1) operation, maintenance, and equipment replacement costs of the power project;

(2) debt service costs associated with the power project;
~~and~~

(3) the costs of safety inspections and investigations of the power project by the authority; and

Sec. 44.83.480. OPERATION OF POWER PROJECT. (a) A power project which is acquired or constructed as part of the energy program for Alaska is owned by the state and shall be administered by the authority.

(b) When a power project has been acquired or constructed by the authority, the project may be operated for the authority under a contract between a qualified utility and the authority.

Sec. 44.83.490. SALE OF POWER FROM POWER PROJECT. ~~(a) The authority shall sell power produced from power projects acquired or constructed under the energy program for Alaska. A utility which purchases power produced by a power project of the authority shall agree with the authority~~

~~(1) to give preference in the sale of power at retail to all classes of consumers of power except industrial consumers;~~

~~(2) to charge industrial consumers of power a rate determined by the authority in accordance with (d) of this section.~~

^a
(b) The authority shall establish a wholesale power rate structure applicable to sales of power to its customers at the busbar of the power project. ~~If, by July 1, 1986, the legislature has not appro~~

- (A) operation, maintenance, and equipment replacement costs of the power project;
- (B) debt service costs of the power ^{DRAFT}_{Law} project;
- (C) safety inspections and investigations of the power project by the authority; and
- (D) a rate of return on the amount invested in the power project by the authority of five percent.

~~priated at least \$5,000,000,000 to the power development fund, the authority shall, beginning on that date, establish and maintain a wholesale power rate for each power project which rate will return to the authority, on an annual basis, 10 percent of the amount appropriated to the power development fund. In addition, the wholesale power~~
rate shall be established as follows:

(1) until June 30 of the fiscal year in which the production capacity of all power projects acquired or constructed by the authority under the energy program for Alaska exceeds 500 megawatts, the authority shall ~~may~~ establish and maintain a wholesale power rate for each power project which ~~rate will return to the authority, on an annual basis, not less than five percent of the amount which the authority has invested in the power project from the fund;~~ provides annual revenue sufficient to pay

(2) beginning July 1 of the first fiscal year following the date on which the production capacity of all power projects acquired or constructed by the authority under the energy program for Alaska exceeds 500 megawatts, the authority shall establish and maintain a single wholesale power rate applicable to all power projects which it has acquired or constructed under the energy program for Alaska; the wholesale power rate shall be computed by the authority annually, and shall equal the rate which the authority estimates is necessary to produce revenue which is sufficient to pay

(A) operation, maintenance, and equipment replacement costs of the power projects;

(B) debt service costs of the power projects;

(C) safety inspections and investigations of the power projects by the authority; and

(D) ~~annual costs of the power production cost assistance program (AS 44.83.162)~~ a rate of return on all amounts invested in the power projects by the authority of three percent.

(d) The authority shall transmit the money which it receives from

DRAFT

The authority shall annually ^{Law} adjust the rate of return specified in (a)(1)(D) and (a)(2)(D) of this section according to changes in the consumer price index for the state compiled by the Bureau of Labor Statistics, United States Department of Labor. The index for November 1980 is the reference base index.

sales of power at rates determined under (b) of this section to the commissioner of revenue for deposit in the state general fund.

~~(d) The legislature may appropriate to the authority an amount not to exceed five percent of the amount determined under (b)(1) and (2) of this section which the commissioner of revenue estimates will be deposited into the general fund for paying costs of operating and maintaining power projects which it acquired or constructed as part of the energy program for Alaska. The balance of the amount determined under (b)(1) and (2) of this section which the commissioner of revenue estimates will be deposited into the general fund may be appropriated by the legislature to the power production cost assistance fund. The estimates of amounts required for each of the appropriations shall be provided to the governor in the budget submitted under AS 37.07.~~

~~(e) A rate for an industrial consumer under (a)(2) of this section (1) may exceed the wholesale power rate determined under (b) of this section;~~

~~(2) may not be less than the rate charged residential consumers.~~

~~(f) The legislature may, by law, annul or change the wholesale power rate for sales of power which the authority adopts under (b) of this section.~~

~~(e) The authority shall estimate the appropriations necessary for the purposes specified in (a)(1)(A) - (C) and (a)(2)(A) - (C) of this section. The estimates required by this subsection shall be provided to the governor in the budget submitted under~~

~~(1) "busbar" means the substation which serves as the delivery point from the generation and transmission system of the authority to the transmission and distribution system of the utility;~~

~~(2) "fund" means the power development fund;~~

~~(3) "industrial consumer" means a customer of a utility which customer has a peak power demand in excess of 500 kilowatts per month and uses the power principally for~~

- 1 ~~(A) manufacturing;~~
2 ~~(B) pipeline transportation;~~
3 ~~(C) the recovery or processing of minerals;~~
4 ~~(D) the processing of timber, agricultural, or seafood~~
5 ~~products or their by products; or~~
6 ~~(E) the operation of facilities owned by the federal~~
7 ~~government;~~

8 ³(4) "qualified utility" means any of the following which the
9 authority determines is capable of operating and maintaining a power
10 project of the kind and magnitude which has been constructed or is to
11 be constructed to provide power for a market area:

- 12 (A) a corporation organized under the Alaska Nonprofit
13 Corporation Act (AS 10.20);
14 (B) an electric cooperative organized under the Electric
15 and Telephone Cooperative Act (AS 10.25);
16 (C) a public utility which generates, transmits, or
17 distributes electrical service to the public; and
18 (D) a regional electrical authority (AS 18.57).

19 * Sec. 2. AS 44.83.030 is amended to read:

20 Sec. 44.83.030. MEMBERSHIP OF THE AUTHORITY. [(a)] The author-
21 ity shall consist of the following directors:

22 (1) two [FOUR] directors at large to be appointed by the
23 governor and confirmed by the legislature;

24 (2) three persons appointed by the governor from among the
25 heads of the ^{state agencies} principal departments of the executive branch of the
26 state government [THE COMMISSIONER OF COMMERCE AND ECONOMIC DEVELOPMENT

27 (b) THE COMMISSIONERS OF COMMUNITY AND REGIONAL AFFAIRS, NATURAL
28 RESOURCES, TRANSPORTATION AND PUBLIC FACILITIES, AND REVENUE SHALL HAVE
29 THE RIGHTS AND PRIVILEGES OF DIRECTORS EXCEPT FOR THE RIGHT TO VOTE AND

MAY NOT BE CONSIDERED FOR PURPOSES OF QUORUM OR VOTING].

* Sec. 3. AS 44.83.040 is amended to read:

Sec. 44.83.040. OFFICERS AND QUORUM. The directors [DIRECTOR] shall elect one of their number [THE DIRECTORS AT LARGE] as chairman and may elect other officers they determine desirable. The powers of the authority are vested in the directors, and three directors of the authority constitute a quorum. Action may be taken and motions and resolutions adopted by the authority at a meeting by the affirmative vote of at least three directors. The directors of the authority serve without compensation, but they shall receive the same travel pay and per diem as provided by law for board members.

* Sec. 4. AS 44.83.045(a) is amended to read:

(a) The directors at large shall [MUST] be residents and qualified voters of Alaska and shall comply with the requirements of AS 39.50 (conflict of interests). The directors at large shall serve overlapping four-year terms. [THE FOUR ORIGINAL DIRECTORS AT LARGE HAVE TERMS OF ONE, TWO, THREE, AND FOUR YEARS, RESPECTIVELY.]

* Sec. 5. AS 44.83.080(16) is amended by adding new subparagraphs to read:

(G) an appropriation for a power project acquired or constructed under the energy program for Alaska (AS 44.83.400 - 44.83.500);

(H) appropriations for the power production cost assistance fund (AS 44.83.162), and for operation and maintenance of power projects developed under the energy program for Alaska (AS 44.83.400 - 44.83.500).

* Sec. 6. AS 44.83.090(a) is amended to read:

(a) The authority shall, in addition to the other methods which it may find advantageous, provide a method by which municipal electric,

1 rural electric, cooperative electric, or private electric utilities and
2 regional electric authorities, or other persons authorized by law to
3 engage in the distribution of electricity may secure a reasonable share
4 of the power generated by a project, or any interest in a project, or
5 for any right to the power and shall sell the power or cause the power
6 to be sold at the lowest reasonable prices which cover the full cost of
7 the electricity or services, including capital and operating costs,
8 debt coverage as considered appropriate by the authority, and other
9 charges that may be authorized by this chapter. Except for a contract
10 entered into under AS 44.83.400 - AS 44.83.500, a [A] contract for the
11 sale, transmission and distribution of power generated by a project or
12 any right to the capacity of it shall provide:

13 (1) for payment of all operating and maintenance expenses of
14 a project and costs of renewals, replacements and improvements of it;

15 (2) for interest on and amortization charges sufficient to
16 retire bonds of the authority issued for the project and reserves for
17 them, plus a debt service coverage factor as may be determined by the
18 authority to be necessary for the marketability of its bonds;

19 (3) for monitoring of the project by the authority or its
20 agents;

21 (4) for full and complete disclosure to the authority of all
22 factors of cost in the transmission and distribution of power, so that
23 rates to any persons may be fixed initially in the contract and may be
24 adjusted from time to time on the basis of true cost data;

25 (5) for periodic revisions of the service and rates to
26 persons on the basis of accurate cost data obtained by the accounting
27 methods and systems approved by the directors and in furtherance and
28 effectuation of the policy declared in this chapter;

29 (6) for the cancellation and termination of a contract upon

violation of its terms by any person;

(7) for security for performance as the authority may consider practicable and advisable, including provisions assuring the continuance of the distribution and transmission of power generated by a project and the use of its facilities for these purposes; and

(8) other terms not inconsistent with the provisions and policy of this chapter as the authority may consider advisable.

* Sec. 7. AS 44.83 is amended by adding a new section to read:

Sec. 44.83.105. BONDS FOR POWER PROJECTS UNDER THE ENERGY PROGRAM FOR ALASKA. The authority shall borrow money and shall issue its bonds on which the principal and interest are payable exclusively from money derived from the power project financed with the proceeds of the bonds for a power project financed under AS 44.83.400 - 44.83.500 from the power development fund if

(1) appropriations to the power development fund for the power project, and interest earned on those appropriations, are insufficient to cover the cost of acquiring or constructing the power project; and

(2) the amount of interest which the authority will pay on its bonds is not more than alternative costs of securing money to pay for the acquisition or construction of the power project.

* Sec. 8. AS 44.83.181(b) is amended by adding a new paragraph to read:

(5) a recommendation as to whether the proposed project is economically feasible; a power project is "economically feasible" if the authority determines that the total costs of the power project are cheaper for the estimated life of the project than other alternatives; in making a determination of economic feasibility under this paragraph, the authority shall evaluate the estimated life of the power project and its alternatives applying the following standard factors:

(A) a general inflation factor for construction and operating costs ~~of seven percent annually;~~

(B) an interest rate ~~of 10 percent~~ for money borrowed for the power project; and

(C) an escalation factor for measuring the comparative cost of oil, gas or coal; ~~the rate to be applied for oil is 11 percent annually, and~~ the rate shall be applied to the fuel cost on the date of determination of economic feasibility.

* Sec. 9. AS 44.25.020 is amended by adding a new paragraph to read:

(5) invest and manage the balance of the power project development fund in accordance with AS 44.83.430.

* Sec. 10. APPLICABILITY OF ACT TO DIRECTORS. (a) The terms of office of all members of the Board of Directors of the Alaska Power Authority serving on the effective date of this Act terminate on the effective date of this Act.

(b) The governor shall appoint two members at large. When making his appointments under this subsection, the governor shall specify the length of the term of office of each member he appoints. Of the members at large first appointed by the governor under this subsection,

(1) one member shall serve a two-year term;

(2) one member shall serve a four-year term.

* Sec. 11. This Act takes effect immediately in accordance with AS 01.-10.070(c).

TELECOPY COVER SHEET

ALL MEMBERS

TO: HOUSE FINANCE COMMITTEE PHONE: 465-3706

FROM: KODIAK IS. BOROUGH School Dis. PHONE: 486-3131

INSTRUCTIONS: _____

RECEIVED: DATE: 4/29/81 TIME: 1:05 p.m.

SENT: DATE: 4/29/81 TIME: 1:32 p.m.

BY: (YOUR OFFICE AND PHONE NO.) _____

DISPOSAL OF ORIGINAL: _____ THROW AWAY

_____ HOLD FOR PICK UP

NUMBER OF PAGES: 1 (NOT COUNTING THIS COVER SHEET)

KODIAK ISLAND BOROUGH SCHOOL DISTRICT

P.O. BOX 886
KODIAK, ALASKA 99615
TELEPHONE: (907) 486-3131

RESOLUTION #801-1

WHEREAS, we support the philosophy of energy efficiency, and

WHEREAS, hydro-power will result in more cost effective educational operation at many of our school sites, and

WHEREAS, we agree with those who believe that State revenues should be used to relieve the cost of living burden of the local citizen, and

WHEREAS, one place that this can occur is through lower costs of educational facilities, now

THEREFORE, BE IT RESOLVED that we urge passage of Senate Bills 25 and 26 as passed by the Senate on March 10, 1981, which will support hydro projects currently ready for construction, and further will provide for hydro development studies in other communities where there is potential of producing power more economically with a hydro facility.

4-28-81

Date

Louise Collins

President, Board of Education
Kodiak Island Borough School District

Approved by Board at Regular Meeting
of April 13, 1981

Net Opportunity Cost to State for Financing an \$87 Million Capital Improvement
with Various User Repayment Provisions
(\$ Millions)

	<u>Cash Flow to State</u>			<u>Total Value of Payments over Project Life (1981 Dollars)¹</u>		
	<u>Annual Payment (Nominal Dollars)</u>	<u>Annual Payment (Nominal Dollars)</u>	<u>Annual Payment (Nominal Dollars)</u>	<u>30 year</u>	<u>50 year</u>	<u>100 year</u>
	<u>30 year</u>	<u>50 year</u>	<u>100 year</u>			
No Principal or Interest Repayment	0	0	0	0	0	0
5% "Equity Return"	4.35	4.35	4.35	60	89	220
10% "Equity Return"	8.70	8.70	8.70	120	178	440
Principal plus 5% Interest	5.66	4.77	4.38	78	98	221
Principal plus 12% Interest	10.80	10.48	10.44	149	214	527
	<u>Opportunity Cost</u>			<u>Total Opportunity Cost (1981 Dollars)³</u>		
	<u>Annual Opportunity Cost (Nominal Dollars)²</u>	<u>Annual Opportunity Cost (Nominal Dollars)²</u>	<u>Annual Opportunity Cost (Nominal Dollars)²</u>	<u>30 year</u>	<u>50 year</u>	<u>100 year</u>
No Principal or Interest Repayment	(10.44)	(10.44)	(10.44)	(149)	(214)	(527)
5% "Equity Return"	(6.09)	(6.09)	(6.09)	(89)	(125)	(307)
10% "Equity Return"	(1.74)	(1.74)	(1.74)	(29)	(36)	(87)
Principal plus 5% Interest	(4.78)	(5.67)	(6.06)	(71)	(116)	(306)
Principal plus 12% Interest	.36	.04	0	0	0	0
	<u>Net Cost to State⁴</u>			<u>Total Cost (1981 Dollars)</u>		
	<u>Annual Cost (Nominal Dollars)</u>	<u>Annual Cost (Nominal Dollars)</u>	<u>Annual Cost (Nominal Dollars)</u>	<u>30 year</u>	<u>50 year</u>	<u>100 year</u>
No Principal or Interest Repayment	(10.44)	(10.44)	(10.44)	(149)	(214)	(527)
5% "Equity Return"	(6.09)	(6.09)	(6.09)	(89)	(125)	(307)
10% "Equity Return"	(1.74)	(1.74)	(1.74)	(29)	(36)	(87)
Principal plus 5% Interest	(4.78)	(5.67)	(6.06)	(71)	(116)	(306)
Principal plus 12% Interest	.36	.04	0	0	0	0

¹ Annual value of payments discounted at the assumed inflation rate of 10%.

² 12% interest on \$87 million.

³ \$87 million principal plus 12% annual interest compounded over project life with future value discounted to 1981 dollars at the inflation rate

⁴ Opportunity cost less cash flow

BRIAN ROGERS

Alaska State Legislature

29 April 1981

TO: Rep. Fred Zharoff
House Resources Committee

FROM: Rep. Brian Rogers

RE: Energy Financing

I have had a chance to review the draft HCS for SS for SB 25 (Resources) which will be before the Resources Committee shortly. I personally have a number of problems with the bill and wish to point out to you specific areas of concern relating to rural energy needs.

Although this bill has been proposed as a compromise financing plan, it appears to me to set up an extremely inequitable method of distributing the state's wealth and, I believe, offers almost nothing for the rural areas of the state where the energy needs are most critical.

The bill, as designed, sets up a new fund in the Power Authority -- the power development fund. Money appropriated to it would then be used by the authority to construct power projects as capital projects of the state. The definition of an "economically feasible" project (p. 10) virtually mandates that these projects be hydroelectric unless hydroelectric resources are not available in a given area.

Once a project is complete, a wholesale power rate would be set to recover at least 5% of the capital cost per year. To use an example, the Tazimina project, if it costs \$123 million (the APA estimate), the first year would be required to pay \$6.15 million. Even if all 7000 residents of the Bristol Bay region were tied into Tazimina power, that would require an average individual payment of \$879 that year, plus the costs of distribution, for electricity.

Only after 800 MW of power were on-line through grants from the fund would an equalized power rate be established for all consumers from the projects. (800 MW would not be on-line until at least 1999 or completion of the second stage of Susitna; this provision guarantees that Susitna would be built.) This equalized rate would not include any consumers except those of the state-owned projects. And not until that time would the legislature be authorized to appropriate money being paid from the state-owned projects to the power production cost assistance fund. This means:

1) Those who don't receive power grants receive nothing under the program until 1999 or later.

2) They may receive nothing even then because all funds, including those for power production cost assistance, must still be appropriated by the legislature.

3) The consumers from the state-owned projects would understand that their electric bills would be used to pay subsidies to the bush, without understanding that their own projects were paid for by grants. Implications from this are particularly troubling, as it would clearly pit urban residents against rural.

The bill goes further, to allow the legislature to "annul or change" the wholesale power rates adopted by the authority in 1999, in effect saying that once Susitna is built, electricity for everyone who's on-board at that time could be given away for free, if the then-legislature decided to do so.

The companion appropriation, HCS for CS for SB 26 (Finance) will not be again considered by the Resources Committee, but I hope that you will look at it together with SB 25. Although on the face of it it appears to include considerable money for rural areas, please note that the \$40 million identified for "power projects in rural areas" (Sec. 17) is appropriated to the power project fund, not the new power development fund. The power project fund is the existing loan fund, which means that the rural areas are in line for loans while others enjoy grants. In effect, SB 25 sets up two separate funds - a grant fund and a loan fund -- with separate standards and criteria, and separate constituencies.

I believe that the version of SB 26 which passed out of Resources Committee is far more equitable than the new finance draft, in terms of the mix of projects included, the areas benefitted and the consistency of financing methods.

The State of Alaska, as you well know, badly needs an energy program. However, to adopt one as single-minded, inequitable, and with such far-reaching ramifications as the one propoosed in SB 25 would clearly not serve the best interests of all Alaskans. I urge you to consider the proposal closely and join me in working for an energy program which benefits all Alaskans.

cc: Bush Caucus Members

YER MEMBER ALLOCATIONS

proposed

DISTRICT	Finance CSB26	Resources CSB26
①	28.5	34.5
②	50.8	61.3
③	52.5	52.5
④	6.25	9.1
⑤	68.0	29.0
⑥	3.9	4.2
⑦-⑫	3.9	4.1
⑬	~~6.4~~ 24.4	~~31.2~~ 5.6
⑭	89.2	105.6
⑮	5.0	5.0
⑯	7.0	4.5
⑰	5.5	5.4
⑱	5.0	.5
⑲	8.9	4.7
⑳	33.9	4.7
㉑	5.2	2.5
㉒	5.0	3.6

Notes: Both have another \$5.6 for bush feasibility

\$4.8 power production

\$2.4 bulk fuel

Resources CS has

15.0 rural electrification

20.0 alternative energy loans

16.3 village energy conservation

12.8 energy conservation/audits

2.3 legislature - coal, gas line

6.9 research + development

1.5 planning

Original sponsors: Kerttula, Dankworth,
Ziegler, et al

1 IN THE SENATE

BY THE RESOURCES COMMITTEE

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18 authority, and constructed with money appropriated by the legislature
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21 energy program for Alaska only if the project is submitted to and
22 approved by the legislature in accordance with procedures set out in
23 AS 44.83.177 - 44.83.185.

24 Sec. 44.83.410. POWER DEVELOPMENT FUND ESTABLISHED. (a) A power
25 development fund is established in the Alaska Power Authority to carry
26 out the purposes of the energy program for Alaska (AS 44.83.400 -
27 44.83.500).

28 (b) The fund includes

29 (1) all money appropriated to it by the legislature; and

1 (2) interest earned by investment of money in the fund by
2 the Department of Revenue.

3 Sec. 44.83.420. USE OF FUND BALANCE. (a) The fund may be used
4 by the authority to provide money for

5 (1) reconnaissance and feasibility studies and power project
6 finance plans prepared under AS 44.83.177 - 44.83.181;

7 (2) the cost of a power project, including but not limited
8 to costs of acquiring necessary licenses, preparing engineering designs
9 obtaining land, and constructing the power project; and

10 (3) the power production cost assistance fund (AS 44.83.162)

11 (b) Money in the fund may be used under (a) of this section only
12 for a power project which

13 (1) meets the operation and revenue requirements of AS 44.-
14 83.470; and

15 (2) operates or will operate

16 (A) on renewable energy resources; or

17 (B) on coal, peat or wood, if the authority determines

18 that

19 (i) the source of the fuel for the project is
20 abundant; and

21 (ii) renewable energy resources to produce power
22 for the market area of the power project are not available or
23 are not economically feasible; or

24 (C) on fossil fuel if none of the other resources or
25 fuels listed in this subsection are economically feasible.

26 Sec. 44.83.430. INVESTMENT OF FUND. The Department of Revenue
27 shall invest the balance of the fund which exceeds the amount the
28 authority determines is necessary to meet requirements of AS 44.83.420
29 during the current fiscal year. An investment by the Department of

1 Revenue under this subsection shall be made in accordance with AS 37.-
2 10.070 and 37.10.075.

3 Sec. 44.83.440. ALLOTMENT TO PROJECTS. (a) The authority shall
4 maintain records of power project allocations from the fund for each
5 power project

6 (1) approved in accordance with AS 44.83.185; and

7 (2) for which an allocation is made from an appropriation
8 made by the legislature without specifying an appropriation to a
9 project.

10 (b) Income earned from investment of money appropriated to the
11 fund shall be allotted by the authority to power projects for which
12 appropriations have been made by law. The allotment shall be based on
13 the amount of investment income earned during each state fiscal year
14 during or after which the legislature appropriated money to the fund.
15 An allotment of income under this subsection shall be made to each
16 power project for which a specific appropriation has been made in
17 proportion to the amount appropriated for that project as a percentage
18 of the total amount appropriated by the legislature to the fund.

19 Sec. 44.83.450. REAPPROPRIATION OF FUND BALANCE. (a) If a power
20 project designated by the legislature by law is not constructed, the
21 amount appropriated to it may be reappropriated to other power projects
22 by the legislature.

23 (b) The legislature may reappropriate money under (a) of this
24 section only for a power project which is economically feasible under
25 AS 44.83.181(b) and only if the project will serve the market area that
26 would have been served by the power project designated by the legisla-
27 ture and not constructed.

28 Sec. 44.83.460. LAPSE OF EXCESS APPROPRIATIONS. If at the end of
29 construction of a power project appropriations for the power project

1 exceed the amount required for construction of it, the excess lapses
2 into the general fund.

3 Sec. 44.83.470. REVENUE REQUIREMENTS. The authority may not use
4 money in the fund for a power project unless the authority determines
5 that, after construction, operation of the power project will provide
6 revenue sufficient to cover

7 (1) operation, maintenance, and equipment replacement costs
8 of the power project;

9 (2) debt service costs associated with the power project;
10 and

11 (3) the costs of safety inspections and investigations of
12 the power project by the authority.

13 Sec. 44.83.480. OPERATION OF POWER PROJECT. (a) A power project
14 which is designed, acquired, and constructed as part of the energy
15 program for Alaska is owned by the state and shall be administered by
16 the authority.

17 (b) When a power project has been designed, acquired, and con-
18 structed by the authority, the project may be operated for the authority
19 under a contract between a qualified utility and the authority.

20 Sec. 44.83.490. SALE OF POWER FROM POWER PROJECT. (a) The
21 authority shall sell power produced from power projects designed,
22 acquired, and constructed under the energy program for Alaska. A
23 utility which purchases power produced by a power project of the
24 authority shall agree with the authority

25 (1) to give preference in the sale of power at retail to all
26 classes of consumers of power except industrial consumers;

27 (2) to charge industrial consumers of power a rate determined
28 by the authority.

29 (b) The authority shall establish a wholesale power rate structure

1 applicable to sales of power to its customers at the busbar of the
2 power project. The wholesale power rate structure shall conform to
3 this subsection as follows:

4 (1) until June 30 of the fiscal year in which the production
5 capacity of all power projects designed, acquired, and constructed by
6 the authority under the energy program for Alaska exceeds 800 megawatts
7 the authority may establish a wholesale power rate for each power
8 project which recovers, on an annual basis, not less than five percent
9 of the amount which the authority has invested in the power project
10 from the fund;

11 (2) beginning July 1 of the first fiscal year following the
12 date in which the production capacity of all power projects designed,
13 acquired, and constructed by the authority under the energy program for
14 Alaska exceeds 800 megawatts, the authority shall establish a single
15 wholesale power rate applicable to all power projects which it has
16 designed, acquired, and constructed under the energy program for Alaska
17 the wholesale power rate shall be computed by the authority annually,
18 and may not be less than the rate which the authority estimates is
19 necessary to produce revenue that

20 (A) is sufficient to cover the annual costs of operation
21 and maintaining all power projects designed, acquired, and con-
22 structed as part of the energy program for Alaska; and

23 (B) will pay the annual costs of the power production
24 cost assistance program (AS 44.83.162).

25 (c) The authority shall transmit the money which it receives from
26 sales of power at rates determined under (b)(2) of this section to the
27 commissioner of revenue for deposit in the state general fund.

28 (d) The legislature may appropriate to the authority an amount
29 not to exceed five percent of the amount which the commissioner of

1 revenue estimates will be deposited in the general fund under (c) of
2 this section for paying costs of operating and maintaining power
3 projects which it designed, acquired, and constructed as part of the
4 energy program for Alaska. The balance of the amount which the commis-
5 sioner of revenue estimates will be deposited into the general fund
6 under (c) of this section may be appropriated by the legislature to the
7 power production cost assistance fund. The estimates of amounts
8 required for each of the appropriations shall be provided to the
9 governor in the budget submitted under AS 37.07.

10 (e) When the authority establishes a rate for an individual
11 consumer under (a)(2) of this section, it may charge the industrial
12 consumer a rate which exceeds the wholesale power rate determined under
13 (b) of this section.

14 (f) The legislature may, by law, annul or change the wholesale
15 power rate for sales of power which the authority adopts under (b)(2)
16 of this section.

17 Sec. 44.83.500. DEFINITIONS. In AS 44.83.400 - 44.83.500,

18 (1) "busbar" means the place where electric current generated
19 from sources within a power project is collected and distributed to
20 outgoing feeder transmission lines;

21 (2) "fund" means the power development fund;

22 (3) "industrial consumer" means a customer of a utility
23 which has a demand for power in excess of ____ kilowatts per ____ and
24 uses the power principally for

25 (A) manufacturing;

26 (B) pipeline transportation;

27 (C) the recovery or processing of minerals;

28 (D) the processing of timber; or

29 (E) the operation of facilities owned by the federal

1 government;

2 (4) "qualified utility" means any of the following which the
3 authority determines is capable of operating and maintaining a power
4 project of the kind and magnitude which has been constructed or is to
5 be constructed to provide power for a market area:

6 (A) a corporation organized under the Alaska Nonprofit
7 Corporation Act (AS 10.20);

8 (B) an electric cooperative organized under the Electric
9 and Telephone Cooperative Act (AS 10.25);

10 (C) a utility owned and operated by a municipality; and

11 (D) a regional electrical authority (AS 18.57).

12 * Sec. 2. AS 44.83.030 is amended to read:

13 Sec. 44.83.030. MEMBERSHIP OF THE AUTHORITY. [(a)] The author-
14 ity shall consist of the following directors:

15 (1) two [FOUR] directors at large to be appointed by the
16 governor and confirmed by the legislature;

17 (2) three persons appointed by the governor from among the
18 heads of the principal departments of the executive branch of the
19 state government [THE COMMISSIONER OF COMMERCE AND ECONOMIC DEVELOPMENT

20 (b) THE COMMISSIONERS OF COMMUNITY AND REGIONAL AFFAIRS, NATURAL
21 RESOURCES, TRANSPORTATION AND PUBLIC FACILITIES, AND REVENUE SHALL HAVE
22 THE RIGHTS AND PRIVILEGES OF DIRECTORS EXCEPT FOR THE RIGHT TO VOTE AND
23 MAY NOT BE CONSIDERED FOR PURPOSES OF QUORUM OR VOTING].

24 * Sec. 3. AS 44.83.040 is amended to read:

25 Sec. 44.83.040. OFFICERS AND QUORUM. The directors [DIRECTOR]
26 shall elect one of their number [THE DIRECTORS AT LARGE] as chairman
27 and may elect other officers they determine desirable. The powers of
28 the authority are vested in the directors, and three directors of the
29 authority constitute a quorum. Action may be taken and motions and

1 resolutions adopted by the authority at a meeting by the affirmative
2 vote of at least three directors. The directors of the authority serve
3 without compensation, but they shall receive the same travel pay and
4 per diem as provided by law for board members.

5 * Sec. 4. AS 44.83.045(a) is amended to read:

6 (a) The directors at large shall [MUST] be residents and qualifie
7 voters of Alaska and shall comply with the requirements of AS 39.50
8 (conflict of interests). The directors at large shall serve over-
9 lapping four-year terms. [THE FOUR ORIGINAL DIRECTORS AT LARGE HAVE
10 TERMS OF ONE, TWO, THREE, AND FOUR YEARS, RESPECTIVELY.]

11 * Sec. 5. AS 44.83.080(16) is amended by adding new subparagraphs to
12 read:

13 (G) An appropriation for a power project designed,
14 acquired, and constructed under the energy program for Alaska
15 (AS 44.83.400 - 44.83.500);

16 (H) appropriations for the power production cost assis-
17 tance fund (AS 44.83.162), and for operation and maintenance of
18 power projects developed under the energy program for Alaska
19 ~~shall~~ (AS 44.83.400 - 44.83.500).

20 * Sec. 6. AS 44.83.090(a) is amended to read:

21 (a) The authority shall, in addition to the other methods which
22 it may find advantageous, provide a method by which municipal electric,
23 rural electric, cooperative electric, or private electric utilities and
24 regional electric authorities, or other persons authorized by law to
25 engage in the distribution of electricity may secure a reasonable share
26 of the power generated by a project, or any interest in a project, or
27 for any right to the power and shall sell the power or cause the power
28 to be sold at the lowest reasonable prices which cover the full cost of
29 the electricity or services, including capital and operating costs,

1 debt coverage as considered appropriate by the authority, and other
2 charges that may be authorized by this chapter. Except for a contract
3 entered into under AS 44.83.400 - AS 44.83.500, a [A] contract for the
4 sale, transmission and distribution of power generated by a project or
5 any right to the capacity of it shall provide:

6 (1) for payment of all operating and maintenance expenses of
7 a project and costs of renewals, replacements and improvements of it;

8 (2) for interest on and amortization charges sufficient to
9 retire bonds of the authority issued for the project and reserves for
10 them, plus a debt service coverage factor as may be determined by the
11 authority to be necessary for the marketability of its bonds;

12 (3) for monitoring of the project by the authority or its
13 agents;

14 (4) for full and complete disclosure to the authority of all
15 factors of cost in the transmission and distribution of power, so that
16 rates to any persons may be fixed initially in the contract and may be
17 adjusted from time to time on the basis of true cost data;

18 (5) for periodic revisions of the service and rates to
19 persons on the basis of accurate cost data obtained by the accounting
20 methods and systems approved by the directors and in furtherance and
21 effectuation of the policy declared in this chapter;

22 (6) for the cancellation and termination of a contract upon
23 violation of its terms by any person;

24 (7) for security for performance as the authority may con-
25 sider practicable and advisable, including provisions assuring the
26 continuance of the distribution and transmission of power generated by
27 a project and the use of its facilities for these purposes; and

28 (8) other terms not inconsistent with the provisions and
29 policy of this chapter as the authority may consider advisable.

1 * Sec. 7. AS 44.83 is amended by adding a new section to read:

2 Sec. 44.83.105. BONDS FOR POWER PROJECTS UNDER THE ENERGY PROGRAM
3 FOR ALASKA. (a) The authority shall borrow money and shall issue its
4 bonds on which the principal and interest are payable exclusively from
5 money derived from the power project financed with the proceeds of the
6 bonds for a power project financed under AS 44.83.400 - 44.83.500 from
7 the power development fund if

8 (1) appropriations to the power development fund for the
9 power project, and interest earned on those appropriations, are insuf-
10 ficient to cover the cost of designing, acquiring, and constructing the
11 power project; and

12 (2) the amount of interest which the authority will pay on
13 its bonds is not more than alternative costs of securing money to pay
14 for the design, acquisition, and construction of the power project.

15 * Sec. 8. AS 44.83.181(b) is amended by adding a new paragraph to read:

16 (5) a recommendation as to whether the proposed project is
17 economically feasible; a power project is "economically feasible" if
18 the authority determines that the total costs of the power project are
19 cheaper for the estimated life of the project than other alternatives;
20 in making a determination of economic feasibility under this paragraph,
21 the authority shall evaluate the estimated life of the power project
22 and its alternatives applying the following standard factors:

23 (A) a general inflation factor for construction and
24 operating costs of seven percent annually;

25 (B) an interest rate of 10 percent for money borrowed
26 for the power project; and

27 (C) an escalation factor for measuring the comparative
28 cost of oil, gas or coal; the rate to be applied for oil is 11
29 percent annually, and the rate shall be applied to the fuel cost

1 on the date of determination of economic feasibility.

2 * Sec. 9. AS 44.25.020 is amended by adding a new paragraph to read:

3 (5) invest and manage the balance of the power project
4 development fund in accordance with AS 44.83.430.

5 * Sec. 10. APPLICABILITY OF ACT TO DIRECTORS. (a) The terms of office
6 of all members of the Board of Directors of the Alaska Power Authority
7 serving on the effective date of this Act terminate on the effective date of
8 this Act.

9 (b) The governor shall appoint two members at large. When making his
10 appointments under this subsection, the governor shall specify the length of
11 the term of office of each member he appoints. Of the members at large first
12 appointed by the governor under this subsection,

13 (1) one member shall serve a two-year term;

14 (2) one member shall serve a four-year term.

15 * Sec. 11. This Act takes effect immediately in accordance with AS 01.-
16 10.070(c).

Chenoweth

Original sponsors: Kerttula, Ziegler,
Ferguson, et al

Funding Information

General Fund	\$521,398,000
Other Funds	-0-
	<u>\$521,398,000</u>

1 IN THE SENATE

BY THE FINANCE COMMITTEE

2 HOUSE CS FOR CS FOR SENATE BILL NO. 26 (Finance)

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 TWELFTH LEGISLATURE - FIRST SESSION

5 A BILL

6 For an Act entitled: "An Act making special appropriations to the Alaska
7 Power Authority for energy projects and for the power
8 production cost assistance program; and providing for
9 an effective date."

10 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

11 * Section 1. The sum of \$341,400,000 is appropriated from the general
12 fund to the power development fund of the Alaska Power Authority (AS 44.83.-
13 400 44.83.500), to be expended by the authority in the amounts specified
14 for the following listed power projects:

15 (1) Bradley Lake	\$40,000,000
16 (2) Green Lake	52,500,000
17 (3) Port Lions	1,400,000
18 (4) Solomon Gulch	68,000,000
19 (5) Swan Lake	53,000,000
20 (6) Terror Lake	81,500,000
21 (7) Tyee Lake	45,000,000

22 * Sec. 2. The sum of \$36,900,000 is appropriated from the general fund
23 to the power development fund of the Alaska Power Authority (AS 44.83.400 -
24 44.83.500) for feasibility studies, to be allocated to the following proposed
25 power projects:

26 (1) Black Bear Lake	2,000,000
27 (2) Chester Lake	1,000,000
28 (3) Chakachamna Lake	1,000,000
29 (4) Grant Lake	1,000,000

1	(5) Kisaralik	1,000,000
2	(6) Power Creek	700,000
3	(7) Snettisham	4,500,000
4	(8) Susitna	18,100,000
5	(9) Tazimina Lake	2,000,000
6	(10) Rural community studies: Akhiok,	
7	Ambler, Angoon, Atka, Chignik, Chignik	
8	Lagoon, Chignik Lake, Cold Bay, Elim,	
9	False Pass, Goodnews Bay, Grayling,	
10	Gustavus, Ivanoff Bay, Kaltag, Karluk,	
11	Kiana, King Cove, Larsen Bay, Nikolski,	
12	Old Harbor, Perryville, Scammon Bay,	
13	Shungnak, Tenakee Springs, Togiak,	
14	Unalaska	5,600,000

15 * Sec. 3. The sum of \$76,000,000 is appropriated from the general fund
 16 to the power development fund of the Alaska Power Authority (AS 44.83.400 -
 17 44.83.500) for acquisition of a right-of-way for and design and construction
 18 of a high voltage electrical transmission system connecting Anchorage and
 19 Fairbanks.

20 * Sec. 4. The sum of \$2,000,000 is appropriated from the general fund to
 21 the power development fund of the Alaska Power Authority (AS 44.83.400 -
 22 44.83.500) for acquisition of a right-of-way for and design and construction
 23 of an electrical transmission system connecting Craig and Klawock.

24 * Sec. 5. The sum of \$5,800,000 is appropriated from the general fund to
 25 the power development fund of the Alaska Power Authority (AS 44.83.400 -
 26 44.83.500) for acquisition of a right-of-way for and design and construction
 27 of an electrical transmission system connecting Petersburg (Tyee Lake power
 28 project) and Kake.

29 * Sec. 6. The sum of \$250,000 is appropriated from the general fund to

1 the power development fund of the Alaska Power Authority (AS 44.83.400 -
2 44.83.500) for a study examining district heating, coal utilization, and
3 waste heat for Kotzebue.

4 * Sec. 7. The sum of \$42,000 is appropriated from the general fund to
5 the power development fund, of the Alaska Power Authority (AS 44.83.400 -
6 44.83.500) for reconnaissance work on the rehabilitation and improvement of
7 hydroelectric facilities for Pelican.

8 * Sec. 8. The sum of \$996,000 is appropriated from the general fund to
9 the power development fund of the Alaska Power Authority (AS 44.83.400 -
10 44.83.500) for a feasibility study examining design and construction of an
11 electrical transmission system between Hoonah and Juneau.

12 * Sec. 9. The sum of \$4,000,000 is appropriated from the general fund to
13 the power project fund of the Alaska Power Authority (AS 44.83.170) for a
14 loan to Alaska Electric Light and Power Company for construction of trans-
15 mission lines.

16 * Sec. 10. The sum of \$3,000,000 is appropriated from the general fund
17 to the power project fund of the Alaska Power Authority (AS 44.83.170) for a
18 loan to Alaska Electric Light and Power Company for rehabilitation of Salmou
19 Creek II.

20 * Sec. 11. The sum of \$1,500,000 is appropriated from the general fund
21 to the power project fund of the Alaska Power Authority (AS 44.83.170) for a
22 loan to the City of Petersburg for local transmission and distribution lines
23 between Tyee Lake power project substations and existing power plants.

24 * Sec. 12. The sum of \$1,500,000 is appropriated from the general fund
25 to the power project fund of the Alaska Power Authority (AS 44.83.170) for a
26 loan to the City of Wrangell for local transmission and distribution lines
27 between Tyee Lake power project substations and existing power plants.

28 * Sec. 13. The sum of \$560,000 is appropriated from the general fund to
29 the Alaska Power Authority for reconnaissance studies for proposed power

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1 project sites for the following rural communities: Aniak, Atkasook, Brevig
2 Mission, Chefornak, Chuathbaluk, Craig, Diomede, Galena, Golovin, Hooper
3 Bay, Kalskag, Kotlik, Koyuk, Lower Kalskag, Mekoryuk, Newtok, Nightmute,
4 Ruby, St. Mary's, St. Michael, St. Paul, Shageluk, Shishmaref, Stebbins,
5 Teller, Toksook Bay, Tununak, and Unalakleet.

6 * Sec. 14. The sum of \$4,800,000 is appropriated from the general fund
7 to the Alaska Power Authority for the power production cost assistance fund
8 (AS 44.83.162).

9 * Sec. 15. The sum of \$2,400,000 is appropriated from the general fund
10 to the Department of Community and Regional Affairs for the bulk fuel storage
11 facilities grant fund (AS 44.47.145).

12 * Sec. 16. The sum of \$250,000 is appropriated from the general fund to
13 the Office of the Governor for the fuel emergency fund (AS 44.19.052).

14 * Sec. 17. The sum of \$40,000,000 is appropriated from the general fund
15 to the power project fund of the Alaska Power Authority (AS 44.83.170) for
16 power projects in rural areas.

17 * Sec. 18. Sections 1 - 8 of this Act take effect on the effective date
18 of an Act entitled "An Act amending the Alaska Power Authority Act; and
19 providing for an effective date."

20 * Sec. 19. Sections 9 - 17 of this Act take effect immediately in accor-
21 dance with AS 01.10.070(c).

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27 April 1981

TO: REP. BRIAN ROGERS

FROM: NANCY LORD, AA

RE. HYDRO PROJECT FINANCING

I have reviewed the Duncan hydro financing plan and compiled the following list of concerns. Because the plan has not yet appeared in bill form, I am, by necessity, responding to the narrative dated April 13, 1981; it may be that some of the concerns addressed will be corrected as the bill is drafted.

1. The relationship between the 5% "equity return" and the 3.8 cents/kwh to be charged to consumers is nothing more than wishful thinking. The APA computed it by making up a "best case" situation and assuming that all the power produced would be immediately utilized. As an example, using the APA's own assumptions of maximum energy use, the Tazimina project, if it provides 5% equity return, would cost 7.7 cents/kwh wholesale. In contrast, Bradley Lake, at 5% equity return, if all the power were used, would cost 2.8 cents/kwh wholesale.
2. Some of the projects listed as feasible could not, in fact, pay a 5% "equity return" without greatly increasing energy costs to consumers. As an example, the Tazimina project would cost, conservatively, \$123 million to construct. A 5% "equity return" would mean a repayment the first year of \$6.15 million. If all 5300 residents of the Bristol Bay region utilized the power, each one would have to pay \$1,160.38 that year. I doubt whether a family of 4 in Dillingham is currently paying \$4,641.50 per year for electricity.
3. The 5% "equity return" bears no relationship to any test of economic feasibility. It appears to have been chosen arbitrarily, its only test being the political one of "sounding good" to those arguing between grants and loans.
4. The proposal includes no requirement for establishing any measure of economic feasibility, or any requirement that projects constructed relate to electricity demand.
5. There is no guarantee of more than a token return on the projects. The 5% "equity return" first pays for operation, maintenance and administrative costs. Then, if there is money left, it goes to the general fund or another fund established. With time the yearly "equity return" remains the same, while the operating and maintenance and administration costs increase, eroding the "equity return" to nothing within a very short time. The concept differs very little, except semantically, from grants.
6. The better projects would have to subsidize the worse. As we saw in #1, a 5% "equity return" would mean quite different rates, even assuming the APA figures. If everyone were arbitrarily charged 3.8 cents/kwh the consumers of Bradley Lake power would be paying more than what their project needed to pay 5%, thus paying part of the costs for another project. Therefore, there is no reason to build a feasible project, and overbuilding is encouraged.

7. The more energy one uses, the greater subsidy one receives. Increased use would be encouraged, and whoever uses the most gets the greatest reward.

8. There are absolutely no incentives for conservation, appropriate energy end-use, or any energy alternatives where hydro power would be available. In order to make the 3.8 cents/kwh approach the 5%, it would be necessary to increase electric consumption to the maximum, but nowhere is there any acknowledgement that maximum consumption would create a need for additional capacity. Energy conservation could be enforced through laws and regulations but that would be exactly contrary to the requirement that available energy be fully consumed.

9. Money from the 5% repayment, after paying operation, maintenance and administrative costs, would be earmarked for spending for conservation and subsidies for the Bush. Since dedications are unconstitutional and any money for other energy-related projects would have to be appropriated by the legislature, there is no reason to tie one to the other. First - of all, even the APA acknowledges that, under the most optimistic case, it would be 1986 before any significant amount of money would be repaid. Conservation efforts, under the 5-year plan now being considered, would be complete by then and power cost assistance for high-cost energy areas is needed until the time that site-specific energy alternatives can be provided. In addition, the politics of the matter are that the hydropower consumers would understand that their electricity payments were subsidizing someone else, an idea that would prove not very popular. The whole concept of tying the repayments, assuming there were some, to other energy projects appears to be a bone tossed to the Bush to make them think they would be getting something from the proposal. In fact, it offers them nothing they don't have without it; they do now and will then have to get legislative appropriations for their projects or subsidies.

10. Only dams would be built under the proposal. There would be no discussion of the alternatives because no alternatives exist once a decision is made to buy a dam, particularly if no feasibility test is involved. There are alternatives to hydro in many places, but not if they're not given a chance to compete on the same grounds. Some alternatives may be included in SB 26 or a separate appropriation bill, but they will be "token" projects needed to provide political balance.

11. All areas of the state would not be included, which means there would be no equity in the distribution of subsidy. Only consumers of hydropower from the state-owned projects would receive the multi-billion-dollar subsidy, with those without hydro projects being left to beg from the general fund.

12. The proposal depends on the construction of the Susitna project. If Susitna is not built the "equity return" required would be doubled to 10%. Since this is politically unacceptable, the proposal amounts to blackmail. The message is: Build Susitna and provide 3 cents/kwh power to the Railbelt or don't build it and all the rest of you hydro users will have to pay twice as much, and anyone without hydro -- well, if you want to live out there you'll have to pay the price.

13. The proposal includes no criteria for deciding whether to build any given project and provides no control on cost overruns. The state would, in fact, be writing blank checks for authorized projects.

14. The proposal, although appropriating only one-tenth the amount this year, commits over \$5 billion to hydro projects, a commitment that once made cannot be broken.

15. The proposal provides no timetable for phasing in the new rate structure, nor any transition into the program.

16. The powers and responsibilities of the APA are greatly increased, giving them more money to handle and more freedom to handle it than any other entity in the state, without any of the controls regular state agencies have. This comes at a time when the purposes of the APA are being questioned and both the legislative and executive branches are planning an energy reorganization.

17. The proposal will, by design, include "something for everyone", making it difficult politically to oppose but differing little from ordinary pork except in scale and in the longer-term inequities among Alaskans which will result.

A second memo with specific recommendations will follow.

HYDROELECTRIC POWER RESOURCES

Alaska has an estimated 47 per cent of the nation's undeveloped hydroelectric power potential at about 700 potential hydropower sites around the State. As with all estimates of resources potential, however, this statement is meaningless unless placed in an economic context. The vast majority of the potential sites-- with about 90 per cent of the State's potential--are either: (1) off-limits for development because of their location in federally protected areas; or (2) too expensive to develop, usually because of their distance from the potential consumers.

Notwithstanding this caution, by the year 2000 Alaska is likely to increase its hydroelectric generating capacity for both electrical and thermal energy by between five-fold and 20-fold over current levels. The main incentives for the transition are sharply rising costs of fossil fuels, and fears of even greater cost increases in the future -- particularly for the petroleum and petroleum products which now provide most of Alaska's energy. As protection against continuing inflation^y in such non-renewable energy sources, the State is likely to increase its reliance on relatively cheap hydropower. The proportion of the State's generation provided by hydropower is projected to increase from about 10-15 per cent of total installed capacity to about 30-50 per cent by the year 2000.

An abundance of falling water--^(the essential ingredient in hydropower--) makes possible Alaska's big move into this energy source. The water turns turbines, which supply the

power. The power can then be used at the site or transmitted through electrical lines. Hydroelectric power projects are usually thought of as being large dams on rivers or on the mouths of lakes, such as the well-known Hoover ~~Dam~~ ^{on the Nevada-Arizona border} or Grand Coulee in Washington State. Many of the most-publicized Alaska hydropower projects now being considered are like this, but others are smaller, mobile turbines which can be taken in and out of streams. "In-stream" hydro projects produce much less power than large dams, but often can be efficient suppliers to local areas, particularly in rural regions.

There are now more than 40 hydroelectric installations in Alaska, ranging in size from 1.5 ~~kilowatts~~ ^{megawatts} to 47,160 ~~kilowatts~~. Most of the sizable dams are concentrated in wet, mountainous Southeastern Alaska, where heavy rainfall and snowfall combine with steep slopes to produce most of the best potentially feasible sites as well. Most of the other potentially feasible hydropower projects are located in the Southcentral region. With electrical transmission interties, a group of these proposed installations could serve the populous Railbelt from the Kenai Peninsula north to Fairbanks.

Besides providing relatively low-cost energy to Alaskans, some supporters of expanding hydropower capacity assert that the resulting supply of ~~stable~~ ^{stably} priced power will create jobs by luring industry to the State. Others discount this possibility, however, arguing that labor costs and distance from markets are much more important factors in most firms' decisions to locate.

Other cautionary notes about hydropower should be sounded. There are significant environmental costs associated with dams in their siltation of rivers and streams (sometimes, as in ~~Washington State~~

(in Washington and Oregon, Columbia River, causing great damage to fisheries). Some scenic and recreational values are also lost in hydropower development, as dams flood terrain and replace free-flowing rivers with large lakes.

More troublesome than the environmental considerations may be the economic questions. Though dams yield relatively cheap power, it's not free by any means. Building dams requires heavy front-end construction costs, and the turbines must also be replaced periodically. The State's bubble of petroleum prosperity could be used in part to pay for hydropower project construction, and some Alaskans favor this course. Others are concerned such a policy will lead to the building of too many dams which cannot generate enough revenues to pay for their operation and maintenance.

Excess capacity can be a particular problem with hydropower development because dams cannot be phased in incrementally. Unlike some other energy technologies -- such as wind generation -- dam-building is an all or nothing proposition. An easy trap is to build a dam which from the day it begins operation produces far more power than the potential consumers can use. This happened when the Canadian province of Newfoundland built one of the world's largest hydro projects at Churchill Falls. After the project began operation in 1971, Newfoundlanders found they could not use all the new power and ended up exporting much of it to Quebec at distress sale prices.

Finally, the imposing size, high visibility, and apparent permanence of dams can distort the thinking of policy-makers. Dams lend themselves to the "monument complex", a syndrome in which political leaders push for gargantuan projects. The projects are sometimes named after their prime sponsor, are handy for use as a backdrop in

photography and films, and acquire a life of their own in the minds of many beyond their economic merits.

(Source: U.S. Army Corps of Engineers)

GEOHERMAL RESOURCES

Alaska has an estimated 20 per cent of the geothermal potential in the U.S. Once again, it's important not to be misled by this figure. As with coal, hydropower, and hard-rock minerals, most of the potential of tapping steam energy from hot springs will not be economically feasible to develop within the lifetime of anyone reading these ~~pages~~ ^{sentences.}

The Division of Energy and Power Development of the State's Department of Commerce and Economic Development has identified five sites feasible to develop now, and another 10 potential sites which could be developed by the year 2020. If all 15 of those sites were producing in 2020, it is estimated that Alaska would still be contributing less than one per cent to total U.S. geothermal production.

It is more enlightening to say that in 40 years' time, geothermal energy could satisfy the needs of two regional centers - Nome and Unalaska - and perhaps half a dozen smaller sites around Alaska.

The prescription for geothermal is the same as for other energy resources in an uncertain world: more research and analysis.

(Source: Division of Energy and Power Development, Alaska Department of Commerce and Economic Development)

PEAT AND OTHER BIOMASS RESOURCES

Millions of acres of Alaska are covered by marshes, moss, and reeds. These lowlands are concentrated along the coast of the Bering Sea in Western Alaska and the Yukon and Tanana Rivers in the Interior, and are usually thought of as being nice for ducks and messy for duck hunters. Yet these lands may hold an energy resource unusual to Americans: peat.

By one of the most conservative estimates, Alaska has 51 per cent of America's peatland about 10 per cent of all the peat in the world. In a world which has seen oil prices increase more than 10-fold in less than 10 years, peat is gaining attention as a potentially major source of energy. It has already attained that status in Finland and Ireland; ~~in the~~ ^{latter country} where 80 per cent of the electrical load is produced by peat, as is most space heating. Alaska's goal over the next 10 years should be to continue investigating the economic potential of its peat resources. Some experts predict Alaska will be selling peat by the year 2000, with the economics of shipping peat briquettes to Asia rivaling those of eastbound coal exports.

Other possibilities for energy production from organic material ("biomass") exist in Alaska, particularly in conjunction with the development of agriculture. When barley is harvested, for example, a portion is unfit for human consumption. One possible use for this residual is to combine it with fishmeal to produce a high-protein

superfeed for hogs and chickens. Another use is to distill the residual into methanol which could then be used as fuel for humans' vehicles.

(Source: Alaska Department of Commerce and Economic Development)