

LEG. FINANCE - BILLS 1979 - 1980 1380  
SB 524 cont., thru SB 528 1380

1	POSITION TITLE Revenue Auditor III			RANGE/STEP 18 A	BARG. UNIT. G	LOCATION Juneau	REV.	APPROV.	DISAPP.
2	TYPE OF POSITION PFT	STAFF MONTHS 12	RP No.	PCN No.	PRIORITY	FORM 12 PAGE/LINE	LEG.		

3	TYPE OF EXPENDITURE	AMOUNT
	1	2
4	PERSONAL SERVICES: SALARY	29,580
5	BENEFITS	4,399
6	FICA	1,967
7	HEALTH INS.	1,524
8	TOTAL PERSONAL SERVICES	37,470
9	TRAVEL	5,500
10	CONTRACTUAL	3,160
11	COMMODITIES	450
12	EQUIPMENT	1,200
13	OTHER	
14	TOTAL COST	47,780

JUSTIFICATION:

Inasmuch as every fish processor doing business in the State of Alaska could form a seafood association as defined in the proposed law, we are requesting one permanent full time Auditor position to handle the auditing functions provided for in the proposed Section 43.75.035(b)(8).

	CODE	FUNDING SOURCE
15		FED RCPTS.
16		GF MATCH.
17		GEN. FUND
18		1-A RCPTS.
19		PGM RCPTS
20		OTHER
21	CONTINUATION	
22	ADDITION	X

FOR BETA USE ONLY

FA KEY NUMBER

COLUMN NO.

AGENCY Department of Revenue PROGRAM AREA Revenue Collection and Management

BRU Audit Division

**13** REQUEST FOR NEW POSITION.

COMPONENT \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

REVISED DATE \_\_\_\_\_

FY 81

THE LEGISLATURE OF THE STATE OF ALASKA  
ELEVENTH LEGISLATURE

FISCAL NOTE

I. REQUEST

Bill/Resolution No. S B 524

Title An act allowing credits against Fisheries Taxes

Requested by \_\_\_\_\_ Date 3-25-80

II. FISCAL DETAIL

Agency Affected \_\_\_\_\_

Program Category Affected \_\_\_\_\_

BRU, Program, or Subprogram(s) Affected \_\_\_\_\_

(Note: If more than one budget component is affected, separate line-item amounts and funding for each component in the analysis section.)

EXPENDITURES (Thousands of Dollars)

	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85
100 PERSONAL SERVICES						
200 TRAVEL						
300 CONTRACTUAL						
400 COMMODITIES						
500 EQUIPMENT						
600 LAND & STRUCTURES						
700 GRANTS. CLAIMS. ETC.						
TOTAL						

FUNDING (Millions of Dollars)

GENERAL FUND	-----	(1.2)	-----	-----	unknown	-----
FEDERAL FUNDS						
OTHER (Specify Fund Source)						

POSITIONS

FULL TIME						
PART TIME						
TEMPORARY						

III. ANALYSIS (See Fiscal Note Preparation Instructions, Section III)

The above mentioned assumes that 25% of the taxpayer credits are actually taken. The basis for the Fy 81 data is the forecast in the Revenue Source Book which incorporates catch and price projections.

The cost to the general fund in subsequent fiscal years is indeterminate but dependant on varying credits, harvests and prices. It is likely that there will be a slight increase over time in credits taken.

IV. DATE 3/25/80

PREPARED BY Vincent Wright

AGENCY Revenue

PHONE 2391

Original: Legislative Finance

cc: Budget and Management

Prime Sponsor (First Legislator Named)

**CATEGORY:** GENERAL GOVERNMENT  
**PROGRAM:** REVENUE COLLECTION AND MANAGEMENT

**AGENCY:** REVENUE  
**BRU (s):** AUDIT; PETROLEUM REVENUE; ENFORCEMENT; TREASURY MANAGEMENT; ADMINISTRATION AND SUPPORT

All Department of Revenue BRU's in the Revenue Collection and Management cover program are included herein. A major emphasis on identifying the "invisible taxpayer" is planned in the FY 81 budget, primarily in the BRUs of Audit, Enforcement, and Administration and Support.

The goals of the Audit BRU are to achieve effective compliance by taxpayers with the tax laws of Alaska, and to raise revenues through an effective audit program. The Revenue Audit staff concentrates on corporate and individual income tax, estate taxes, excise taxes, business license tax, fisheries tax, mining license tax, and the issuance of permits for games or skill or chance.

The goals of the Petroleum Revenue BRU are to administer state taxes on oil and gas production, which includes the State oil and gas property tax, oil and gas production tax and the oil and gas corporate income tax, and also to coordinate with local governments also taxing that property. The Division of Petroleum Revenue also generates revenue estimates for the State of projected oil and gas related revenues.

The goal of the Enforcement BRU is to enforce the collection of taxes from all taxpayers in a fair and equitable manner. The Division is responsible for billing and collecting all delinquent tax accounts.

The goals of the Treasury Management BRU are to manage available funds for a maximum return consistent with statutory limitations; to place general bonded debt as needed for capital projects at minimum cost to the State; and to report the management of funds in accordance with current reporting standards. The Treasury Management Division works closely with the State Bond Committee in performing these functions. Fund management is centralized for the Public Employees Retirement Fund, the Teachers Retirement Fund, and the General Fund, as well as other special funds.

The Administration and Support BRU includes the Office of the Commissioner, Administrative Services, and Fish and Game Licensing. The Commissioner's Office oversees all functions of the Department of Revenue. The Research Section, under the Office of the Commissioner, performs special studies in analyzing and developing revenue sources, as well as projecting State cash flow through revenue estimating models and information provided by State agencies. The Administrative Services component provides centralized general services for the Department of Revenue, including personnel, budget, payroll, purchasing, mail, etc. This section also provides certain technical services such as administering business licenses, processing tax and license remittances, and initial processing of tax returns. The Fish and Game Licensing component is being transferred to this BRU from the Natural Resources category for FY 81. This component processes revenues received from the sales of Fish and Game licenses statewide. Most of the licenses are sold by contract vendors such as sporting goods stores.

COMPONENT DESCRIPTION	79 AUTH	79 FINAL	79 ACT	80 AUTH	80 SUPL.	80 RP	GOVERNOR
AUDIT	2461.5	2530.6	2513.1	2691.6			3223.6
PETROLEUM REVENUE	1279.6	1240.1	1187.3	1435.0			1447.2
ENFORCEMENT	1196.5	1335.4	1324.7	1217.0			1366.3
TREASURY MANAGEMENT	1232.3	1227.9	1120.3	1357.1			1436.9
OFFICE OF THE COMMISSIONER	877.3	1077.4	1054.4	757.6			964.5
ADMINISTRATIVE SERVICES	1630.0	1783.7	1746.5	1773.6			2361.4
FISH AND GAME LICENSING	572.1	580.6	531.6	259.0			298.0
** TOTAL	9249.3	9775.7	9477.9	9490.9			11097.9
** CHANGE VERSUS 80 AUTH							16.9%
OBJECT DESCRIPTION							
PERS. SERV.	6294.0	6685.5	6654.2	6784.4			7519.5
TRAVEL	336.8	333.8	316.3	315.7			419.6
CONTRACTUAL	2218.2	2320.1	2075.1	2031.5			2728.1
COMMODITIES	68.5	69.3	59.0	58.2			80.9
EQUIPMENT	23.5	58.7	65.3				37.0
LANDS/BLDGS	308.3	308.3	308.0	301.1			312.8
FUNDING SOURCE							
GENERAL FUND	8446.3	9040.7	8635.4	8956.9			10520.7
PGM RECEIPTS	308.0	240.0	217.5				
OTHER FUNDS	495.0	495.0	625.0	534.0			577.2
** GENERAL FUND CHANGE VS. 80 AUTH							17.4%
POSITIONS							
FULL-TIME	220.0	220.0	220.0	224.0			237.0
PART-TIME	8.0	8.0	8.0	8.0			21.0
TEMPORARY	14.0	14.0	14.0	13.0			
STAFF MONTHS	2715.1	2715.1	2715.1	2784.0			2944.2



# RECORDS



# CERTIFICATION

I, the undersigned, an employee of the State of Alaska, do hereby certify that the microfilm images on this microform are accurate reproductions of the original records of the State of Alaska as accumulated during the regular course of business, and that it is the established policy and practice of this State to microfilm its records and to dispose of the original records after microfilm reproductions have been made.

James O. Smith  
Signature of Camera Operator

3/23/90  
Date



Introduced: 3/21/80  
Referred: Finance

1 IN THE SENATE

BY THE STATE AFFAIRS COMMITTEE

2 SENATE BILL NO. 527

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 ELEVENTH LEGISLATURE - SECOND SESSION

5 A BILL

6 For an Act entitled: "An Act relating to the Alaska Power Authority and  
7 approving the general design and maximum amount of  
8 bonds for power projects; and providing for an effective  
9 date."

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

11 \* Section 1. Actions taken by the legislature before the effective date  
12 of this Act to approve the general design and maximum amount of bonds for  
13 power projects are confirmed and the Alaska Power Authority is authorized to  
14 issue its bonds for the following power projects in the maximum principal  
15 amount set out after each:

- 16 (1) Solomon Gulch, \$20,000,000;
- 17 (2) Terror Lake, \$120,000,000;
- 18 (3) Golden Valley Electric Association waste heat, \$110,000,000;
- 19 (4) Tyee Lake, \$70,000,000;
- 20 (5) Swan Lake, \$120,000,000;
- 21 (6) Glacier Highway Electric Association, \$800,000;
- 22 (7) Cordova Electric Cooperative, \$6,500,000;
- 23 (8) Matanuska Electric Association, \$2,500,000;
- 24 (9) Homer Electric Association, \$3,360,000; and
- 25 (10) Haknek Electric Association, \$730,000.

26 \* Sec. 2. This Act takes effect immediately in accordance with AS 01.10.-  
27 070(c).

29 COPY

ALASKA STATE LEGISLATURE

ELEVENTH Legislature SECOND Session

SENATE BILL NO. 527

By THE STATE AFFAIRS COMMITTEE

"An Act relating to the Alaska Power Authority and approving the general design and maximum amount of bonds for power projects; and providing for an effective date."

Introduced in the Senate 3/21/80, 19.....

HISTORY IN THE SENATE

19	80	Read first time and referred to Committee on Finance																						
3	21	Reported back with recommendation that																						
		Read second time and																						
		Read third time and																						
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		Reported correctly engrossed Signed by President Sent to House																						
SECRETARY OF THE SENATE																								

HISTORY IN THE HOUSE

19		Read first time and referred to Committee on																						
		Reported back with recommendation that																						
		Read second time and																						
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CHIEF CLERK OF THE HOUSE																								

HISTORY IN THE SENATE

19		Received from House
		To enrolling
		Reported correctly enrolled
		Sent to Governor
		..... by Governor
		Filed with Lt. Governor
		Chapter No. ....

See page 7 relating to Alaska  
Power Authority Projects

STATE OF ALASKA  
THE LEGISLATURE

LEGISLATIVE AFFAIRS AGENCY

~~H. OGDEN~~  
9.  
POUCH Y - STATE CAPITOL  
JUNEAU, ALASKA 99811  
907-465-3800

MEMORANDUM

February 28, 1980

SUBJECT: State of Alaska v. A.L.I.V.E. Voluntary

TO: Representative Nels A. Anderson, Jr.  
House Majority Leader

FROM: Billy G. Berrier *BGB*  
Director  
Division of Legal Services

You have asked my comments on the decision of the Supreme Court in the case of State of Alaska v. A.L.I.V.E. Voluntary, (File No. 3670). A copy of the decision is attached.

The case concerns a regulation relating to games of skill and chance annulled by the legislature. The authority for annulment was AS 44.62.320(a) which provides:

The legislature, by a concurrent resolution adopted by a vote of both houses, may annul a regulation of an agency or department.

The Administrative Procedure Act was adopted by the First State Legislature in 1959. This Act provided, among other things, for the procedure by which regulations of agencies or departments are promulgated and the section was enacted as part of that procedure.

The Court held, with a majority opinion of three justices and a strong dissent by two justices, that regulations could not constitutionally be annulled by concurrent resolution since a resolution is not enacted in accordance with the requirements in Article II of the Constitution for adoption of law. The result, of course, is a non sequitor since the majority opinion avoided addressing the difference between regulation and law and finding that despite the difference, the enactment procedures applied. They, therefore, assumed the middle term of the syllogism and rambled widely to provide a substitute for the missing logic. Various cases were cited, only one of which was relevant and that one is no longer good law in its own jurisdiction.

For this reason, it is very difficult to determine the effect of the decision.

The holding is explicit that regulations may not be annulled by concurrent resolution. Although it is not explicitly stated, there is a clear implication that annulment by bill is constitutional.

Beyond that, the Court made several statements which do not appear necessary to the holding in this case. Much of this dicta is in sweeping terms. It casts doubt over substantial areas and, since the reasoning is essentially stream of consciousness rather than coherent, gives only minimal clues concerning the legal status of these areas.

Essentially the areas affected fall into two classes

- (1) regulations and legislative oversight of regulations;  
and
- (2) other areas of law where concurrent resolutions are used to provide legislative oversight.

On regulations the majority opinion states broadly:

"The express provision in the Alaska Constitution of two specific legislative veto mechanisms supports our view that no implied general power to veto agency regulations by informal legislative action exists.

\* \* \*

"In our view, the specificity with which the constitution deals with the legislative veto powers it does grant leads logically to the conclusion that no other veto power is implied."

The case law on regulations which the majority opinion cited is not helpful. One of the cases is on point but is no longer good law in its own jurisdiction, the second is a trial court decision and the last is a federal case where the question of a one-house veto was present but not reached. The discussion of this last case illustrates the difficulty in following the reasoning in the majority opinion. The Court referring to the United States Circuit Court decision in Atkins v. United States, 556 F2d 1028 (1977) said:

The court implied that for one House to have the authority to make such a change would be unconstitutional: "Nor could one House do anything more than preserve existing law. . ." Id. at 1064. In contrast, the annulment provisions of AS 44.62.320(a) permit the legislature to void administrative regulations which are in effect. Such regulations are laws in every meaningful sense, and nulling any one of them effects a change in the law.

The connection and logic totally escape me.

In its discussion of delegation of power to annul regulations, an issue injected into the opinion since no delegation is involved in the case before the Court, the opinion is even less helpful. The majority opinion observes:

"While the power to void agency regulations could be exercised by either the legislature, or by an agency, when the legislature exercises such power it must do so while acting as a legislature. It may not grant itself the power to act as an agency.

"It might be supposed that if the legislature could condition the validity of a regulation upon the subsequent disapproval by both of its houses by concurrent resolution, it could condition the same upon disapproval by a committee, or a single legislator. Using the theory, propounded by the Ancients, that a veto is merely a condition there is no principled distinction between these cases. It is therefore worth observing that most authorities have rejected the validity of laws conferring either affirmative or negatory legislative powers on individual legislators or legislative committees."

Perhaps the second point made by the majority opinion in discussing the desirability of legislative oversight of administrative regulations gives the best clue. The opinion stated:

Second, at least according to a recent case study, the legislative veto has been unimpressive in practice. See Bruff & Gellhorn, Congressional Control of Administrative Regulation: A Study of Legislative Vetoes, 90 Harv. L. Rev., 1369 (1977). That study concludes, essentially, that the legislative veto encourages secretive, poorly

informed, and politically unaccountable legislative action. Id. at 1409-20. It is consequences such as these that the enactment provisions of our constitution are designed to guard against.

It should be pointed out that the facts concerning the annulment which was the subject matter of the case do not support a conclusion that the annulment resulted from "secretive, poorly informed and politically unaccountable legislative action" but that, of course, is not material.

It is my conclusion that any annulment of regulation other than by law would be unconstitutional under this case. Although the question is not discussed since it is not relevant to the case, it is very clear that regulations which have the effect of law require statutory authorization and the legislature can withdraw the authorization or establish standards in whatever degree of specificity the legislature desired. Since in case of conflict between statute and regulation the statute controls, it is also clearly permissible to make the substantive statutes detailed thereby leaving less or no areas which must be dealt with by regulations. This latter course, however, involves a loss of flexibility and administrative expertise.

It appears that any form of legislative oversight of administrative regulations would be regarded with suspicion by the court. However, devices such as providing that no regulation can become effective until it has been before the legislature in session for a set time or even a provision that no regulation may become effective unless approved by law are not clearly precluded.

In Plumley v. Hale, 594 P.2d 497 (Alaska 1979), our Court discussed the question of non-retroactive treatment in civil cases. The Court in that case stated:

In accord with United States Supreme Court precedent, we have previously identified four conditions indicating the propriety of non-retroactive treatment in civil cases: 1) the holding is one of first impression, or overrules prior law, and was not foreshadowed in earlier decisions; 2) there has been justifiable reliance on an alternative interpretation of the law; 3) undue hardship would result from retroactive application; and 4) the

Representative Nels A. Anderson, Jr.

Page 5

February 28, 1980

purpose and intended effect of the holding is best accomplished by prospective application.

The case concerned approval of free conference committee reports without a recorded roll call vote. The Court held the criteria to be satisfied and the decision to be prospective only. In my opinion the facts here, while not as compelling as the facts in Plumley, would lead to a conclusion that annulment of regulations which occurred prior to this case are not affected by the case.

The second major problem area is legislative oversight exercised by concurrent resolution in other areas than regulation oversight. The majority opinion made a very broad statement saying:

The question presented by this case is whether the legislature can exercise its legislative power without following these enactment provisions. In our view the answer must be in the negative, for otherwise they would serve no purpose.

(The dissenting opinion quite correctly pointed out this is not the question at all. Justice Boochever said

In my opinion, the majority misstates the question presented as being whether the legislature can exercise its legislative power without the usual constitutional safeguards. The real question is whether, having exercised its legislative power, subject to all those safeguards, it may condition the delegation of regulatory power to an executive agency upon a provision for legislative oversight. I agree with our statement in Boehl that the legislature has that power.

This view will be significant in subsequent cases which concern the use of concurrent resolutions in context other than annulment of regulations placing as it does the issue before the Court in focus.)

The majority opinion went on to say:

Of course, when the legislature wishes to act in an advisory capacity it may act by resolution. However, when it means to take action having a binding effect on

those outside the legislature it may do so only by following the enactment procedures.

While the dissent noted that numerous other statutes provide some specific legislative review function by concurrent resolution, the majority opinion does not specifically address this. The sweeping generality of the majority opinion clouds, and on its face forbids, these other functions.

These include:

1. AS 18.45.025 -- Approval of facilities siting permit for nuclear facilities.
2. AS 18.65.060 -- Disapproval of regulations relating to compilation of criminal justice information and release of this information.
3. AS 28.05.021 -- Approval of compacts with other states relating to motor vehicle registration and driving licenses.
4. AS 28.15.141 -- Approval of regulations relating to classification of drivers licenses.
5. AS 28.15.081 -- Approval of regulations relating to drivers license examination.
6. AS 35.10.080 -- Approval of physical facility procurement and planning policy.
7. AS 37.05.280 -- Approval of leases by the state with a rental in excess of \$12,000. (While this has general application, it was adopted as part of and specifically relates to construction of public buildings by ASHA for lease to the state and is necessary for the validity of the revenue bonds issued by ASHA.)
8. AS 37.12.080 -- Approval of investments in a single project or to a single applicant by Alaska Renewable Resources Corporation if the investment exceeds \$1,500,000 or five percent of the resources of the corporation.
9. AS 38.05.037 -- Disapproval of zoning by the division of lands in the unorganized borough.

February 28, 1980

10. AS 38.05.182 -- Disapproval of a determination by the Commissioner of the Department of Natural Resources that the taking of royalty on natural resources in money rather than in kind is in the best interests of the state.

11. AS 38.05.065 -- Approval of disposition of oil and gas and contracts for sale of state owned royalty gas or oil.

12. AS 39.23.080 -- Approval of salary commission recommendations. (This is now repealed but until the pay bill this year went into effect, it was the basis on which higher government officials, including the governor, legislators and judges, were paid.)

\* 13. AS 44.55.110 -- Approval of Alaska Power Authority plans. This approval is a specific condition on bonding.

14. AS 44.57.210 -- Approval of projects of the Alaska Toll Bridge Authority. This approval is required before bonds may be issued.

15. AS 46.03.758 -- Disapproval of regulations establishing civil penalties for discharge of oil.

16. AS 46.40.080 -- Approval of Alaska coastal management programs.

While all of these are clouded by the language in the majority opinion, that language is clearly dicta except on the point of annulment of regulations. In my opinion, an attempt to determine whether in later cases the court would follow the broad sweep in the instant case, narrow that sweep depending on the issue before it, or even confine the case to its facts would be pure speculation. Courts have frequently done all three. The majority opinion with its conclusionary approach unsupported by a coherent rationale is of little assistance in determining the scope of the opinion.

Earlier in the opinion, I discussed retro-activity as it applied to regulations annulled by concurrent resolution before the opinion. There is an even stronger case for holding that retroactive application cannot be given to a decision in the areas where annulment of regulations is not in question.

I. All give them power to regulate. ✓  
Admin Proc. Dept. - read.

rehearing.

Representative Nels A. Anderson, Jr.

Page 8

February 28, 1980

I am, however, very disturbed by the possibility that a future decision in this area could be retroactive to the date of this decision based on a finding by the Court that this decision "clearly foreshadowed" a subsequent decision that resolutions could not be used as prescribed in these statutes. I do not think this would be the decision since certainly at the time of enactment of the laws referred to there was no foreshadowing and bringing all legislative action to a halt in areas of major concern to the state while the legislature re-wrote the law in these areas is certainly not reasonable.

Since the alternative would be to halt, among other things, power development, coastal zone management, and oil and gas sales based on a possibility that the Court will look legislative oversight in these areas as unfavorably as it does on legislative oversight of regulations, I recommend continuing to operate within the statutory framework now established until the Court, by a subsequent decision, clarifies its position.

I would also recommend that the legislature consider the question of what options are open to it to meet the serious problems created by the case.

BGB:jdn

Introduced: 3/21/80  
Referred: Finance

1 IN THE SENATE

BY THE STATE AFFAIRS COMMITTEE

2 SENATE BILL NO. 527

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 ELEVENTH LEGISLATURE - SECOND SESSION

5 A BILL

6 For an Act entitled: "An Act relating to the Alaska Power Authority and  
7 approving the general design and maximum amount of  
8 bonds for power projects; and providing for an effective  
9 date."

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

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26 \* Sec. 2. This Act takes effect immediately in accordance with AS 01.10.-  
27 070(c).



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James O. Smith  
Signature of Camera Operator

3/23/90  
Date



528

Introduced: 3/21/80  
Referred: Finance

BY THE RULES COMMITTEE BY  
REQUEST OF THE LEGISLATIVE  
COUNCIL BY REQUEST

1 IN THE SENATE

2 SENATE BILL NO. 528

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 ELEVENTH LEGISLATURE - SECOND SESSION

5 A BILL

6 For an Act entitled: "An Act relating to alternative energy research, de-  
7 velopment, and demonstration."

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

9 \* Section 1. PURPOSES. The purposes of this Act are to

- 10 (1) stimulate research, development, and demonstration of alterna-
- 11 tive energy sources;
- 12 (2) lessen reliance on nonrenewable energy sources; and
- 13 (3) provide for the financing of research, development, and
- 14 demonstration of alternative energy sources.

15 \* Sec. 2. AS 45.88 is amended by adding new sections to read:

16 ARTICLE 2. ALTERNATIVE ENERGY RESEARCH,  
17 DEVELOPMENT, AND DEMONSTRATION GRANTS.

18 Sec. 45.88.050. ALTERNATIVE ENERGY RESEARCH, DEVELOPMENT, AND  
19 DEMONSTRATION FUND. There is established in the Department of Commerce  
20 and Economic Development the alternative energy research, development,  
21 and demonstration fund. The fund shall be administered by the depart-  
22 ment. The fund may be financed by appropriation.

23 Sec. 45.88.060. POWERS OF DEPARTMENT. The department may

- 24 (1) employ staff to administer AS 45.88.050 - 45.88.100;
- 25 (2) retain professional consultants and advisors;
- 26 (3) adopt regulations and procedures to administer the fund;
- 27 (4) consider applications for grants and make grants for
- 28 projects that will further the purposes of AS 45.88.050 - 45.88.100;

29 Sec. 45.88.070. APPLICATIONS FOR GRANTS. A person may apply to  
SB 528

COMMITTEE COPY

1 the department for a grant to conduct research in, to develop, or to  
2 demonstrate alternative energy sources. The department shall prescribe  
3 the form for applications. An applicant shall describe the nature of his  
4 proposed research, development, or demonstrations, including practical  
5 applications of possible results, the time which will be required to  
6 complete the research, development, or demonstration, and the potential  
7 for using the results of the research, development or demonstration in  
8 various areas of the state.

9 Sec. 45.88.080. CRITERIA FOR GRANTS. The department may make  
10 grants to applicants under AS 45.88.070 according to the following  
11 criteria:

12 (1) the department shall give preference to a project if, in  
13 the opinion of the department, the possible results of the project will  
14 provide benefits or information which are useful in all areas of the  
15 state;

16 (2) the department may give preference to a project which is  
17 also supported by grants from the federal government or from other  
18 persons if the other grants are consistent with the purposes expressed  
19 in AS 45.88.050 - 45.88.100;

20 (3) the department shall give preference to a project which  
21 makes information available to individuals, families, small businesses,  
22 and small communities on the use of alternative energy sources in their  
23 homes, plants, places of business, and small communities;

24 (4) the department shall notify the recipient of a grant that  
25 the information resulting from the research, development, or demonstra-  
26 tion shall be public and is not the private property of any person;

27 Sec. 45.88.095. ALTERNATIVE ENERGY PLAN. The department shall  
28 prepare a plan by November 30 of each year. The plan shall describe

29 (1) the long-term and short-term objectives of the department

1 for the next five years for the research and development of alternative  
2 energy; and

3 (2) the method to be used by the department to achieve those  
4 objectives.

5 Sec. 45.88.090. REPORTS. The department shall report its expendi-  
6 tures and other activities under AS 45.88.050 - 45.88.100 to the legis-  
7 lature by the 20th day of each regular legislative session. The depart-  
8 ment shall include in its report an assessment of its progress during  
9 the previous year in meeting the short-term and long-term objectives in  
10 the plan prepared under AS 45.88.085.

11 Sec. 45.88.100. DEFINITIONS. In AS 45.88.050 - 45.88.100,

12 (1) "alternative energy" means a form of energy, other than  
13 hydroelectric energy or energy from oil or natural gas, which is  
14 renewable, including but not limited to solar energy, wind energy,  
15 energy from methane produced from solid waste, or energy from other  
16 sources which are not widely used on a commercial basis; "alternative  
17 energy" also means energy conservation methods which are not widely used  
18 on a commercial basis, including but not limited to fuel cells;

19 (2) "department" means the Department of Commerce and  
20 Economic Development;

21 (3) "fund" means the alternative energy research, develop-  
22 ment, and demonstration fund.

23 (4) "small community" means a city, borough or unincorporated  
24 area which has a population of less than 5,000 according to the latest  
25 United States census figures or according to estimates of population  
26 certified as correct by the Department of Community and Regional  
27 Affairs.  
28  
29

ALASKA STATE LEGISLATURE

ELEVENTH Legislature . . . . . SECOND Session

SENATE BILL . . . . . NO. 528

By THE RULES COMMITTEE BY  
REQUEST OF THE LEGISLATIVE  
" COUNCIL BY REQUEST

"An Act relating to alternative  
energy research, development,  
and demonstration."

Introduced in the Senate . . . . . 3/21/ 19. . . . . 80

HISTORY IN THE SENATE

19 80  
3 21

Read first time and referred  
to Committee on  
Finance

Reported back with  
recommendation that

Read second time and

Read third time and

<b>PASS</b>	<b>Effective Date</b>
Yeas	Yeas
Nays	Nays
Absent	Absent
Excused	Excused

Reconsideration	
<b>PASS</b>	<b>Effective Date</b>
Yeas	Yeas
Nays	Nays
Absent	Absent
Excused	Excused

Reported correctly engrossed  
Signed by President  
Sent to House

SECRETARY OF THE SENATE

HISTORY IN THE HOUSE

19

Read first time and referred  
to Committee on

Reported back with  
recommendation that

Read second time and

Read third time and

<b>PASS</b>	<b>Effective Date</b>
Yeas	Yeas
Nays	Nays
Absent	Absent
Excused	Excused

Reconsideration	
<b>PASS</b>	<b>Effective Date</b>
Yeas	Yeas
Nays	Nays
Absent	Absent
Excused	Excused

Reported correctly engrossed  
Signed by Speaker  
Returned to Senate

CHIEF CLERK OF THE HOUSE

HISTORY IN THE SENATE

19

Received from House

To enrolling

Reported correctly enrolled

Sent to Governor

..... by Governor

Filed with Lt. Governor

Chapter No. ....

# STATE OF ALASKA

## DEPARTMENT OF COMMERCE & ECONOMIC DEVELOPMENT DIVISION OF ENERGY & POWER DEVELOPMENT

JAY S. HAMMOND  
GOVERNOR

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April 15, 1980

Senator John Sackett  
Chairman  
Senate Finance Committee  
Pouch V  
Juneau, Alaska 99811

Dear Senator Sackett:

Larry Caudle of Senator Hohman's staff has informed me of an interest on the part of the Committee in additional backup information for Senate Bills 528 and 529 relating to an alternative energy research development and demonstration program.

The proposed legislation will formalize existing Divisional R & D efforts which have been underway during the past couple of years. To date limited funding has prevented the establishment of a comprehensive energy R & D program which addresses in a systematic and prioritized manner the use of local energy resources throughout the state and the development of applicable technologies and applications for utilizing these resources. Unfortunately, our efforts have been piecemeal and heavily dependent upon federal funding. If the proposed legislation were enacted, the Division would be able to launch an aggressive and orderly program for "bringing on line" those technologies and non-traditional energy resources which will be instrumental in achieving the what, I believe, is a realistic goal of Alaskan energy self-sufficiency.

### BACKGROUND

Alaska has known opportunities for alternative energy development which are unsurpassed by any other state. For example, hydropower may very well meet the electrical requirements of 95% of Alaska's residents by the year 2000. Regional hydropower based power grids may serve Southeastern and Railbelt consumers. Other areas under study by the Alaska Power Authority for hydropower include Bristol Bay and the Lower Kuskokwim where feasibility of regional power systems is still being determined. There remain, however, many areas of the State where hydropower may not be appropriate or possible. Also, there are many other transportation and direct use applications which lend themselves to the use of non-traditional fuels and energy sources.

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Particularly important for remote rural communities is the need to use local energy sources, such as coal, peat, wood and wind, whenever possible. As you know, the major contributing factor to the extremely high costs in the bush for goods and services, including energy, is transportation. Elimination of this element, or at least its reduction in cost, is essential to the very survival of some villages.

The technologies to achieve this shift to alternative and, ideally, renewable energy resources are in various stages of development. However, a real danger exists. The inappropriate use of a new technology in the Alaskan setting may result in "setting back" the transition to alternative energy by several years. For example, many people believe that medium scale (15 Kw or larger) wind systems can now be purchased, installed and used with the same reliability as diesel powered generators. This is not true. Their commercial use in remote villages is still several years away. Without controlled testing and demonstration of these systems, early failures will actually delay the its eventual widespread use in the state.

Although reiterated ad nauseam, conditions in Alaska are unique and often have little or nothing in common with the other 49 states. New hardware and systems in the lower 48 are not designed or engineered to meet the strains and stresses which are "par for the course" when attempting to operate and maintain mechanical and electrical systems in remote locations. In fact, regional differences within the state also mean what may work in Southeastern will not necessarily work in Barrow.

Without a strong State-sponsored alternate energy R & D program, the alternative energy resources will not be developed in a timely manner nor will technologies become Alaskan tested and proven. Rather than an acceleration of the transition away from existing oil and gas based systems, the process will actually be slowed down or halted because of ill-timed, poorly planned and inadequately financed projects which eventually fail.

An organized and planned State-financed alternate energy R & D program will eliminate these problems.

#### APPROACH

At least during the early years of the program, the State should not expend funding for basic research under this program unless it is clearly demonstrated that significant progress toward achieving the energy self-sufficiency objective will be realized in the near to mid-term time frames. These longer term projects should take a secondary role in the beginning.

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Emphasis will be placed on those technologies and applications that are in the near commercialization phase or have actually been demonstrated in the lower 48, but have not been tested and evaluated in the rigors of the Alaskan climates and operating conditions.

Because of the severe and worsening energy problem in the smaller rural communities, the lion's share of the funding will address community scale problems and applications such as electrification, fuel production and use in these areas. It is recognized, however, that important components of these community scale efforts are individual residential and commercial applications such as transportation and home heating. Conservation (efficient energy production and use) will also be included as an alternative energy since it probably has the most potential for immediate benefit and savings.

#### The Plan

Many of the early stages of planning have already been completed by the Division. Under the federally-funded regional assessment and other programs, an evaluation of the State's energy resources and their development status and potential have been completed. A preliminary analysis of the technologies required for the extraction and eventual use of these resources has also been conducted. Opportunities for alternative energy development within the State's diverse regions have been identified and preliminary R & D work begun.

In order to maximize the financial support available, it is essential that a detailed and systematic R & D program which identifies and prioritizes areas of concentration be developed at the onset. In addition to the criteria outlined above a measurement of the impact the technology's use will have on the State must be a key consideration in the prioritization process. For example, once developed, should it be able to be used at only one site serving a small number of people, the technology or application would not be a high priority item.

Quantifiable objectives, specific timetables, estimated costs for the project completion, private sector involvement and commercialization follow-through must be explained in detail.

One of the major failures of the United States Department of Energy's multi-million dollar R & D program has been the inability to make the crucial step from technology development to private sector commercialization and ultimate use by the public. Because of this, early and direct involvement by the business sector is necessary to the success of the program.

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Special attention will be placed on detailed market analysis assuring private sector follow through once the technologies are ready for widespread use. Other existing state and federal programs, such as the Alaska Renewable Resources Corporation, will be investigated as possible sources for providing the private sector with needed commercialization capital. Once Alaskan proven, other traditional financing mechanisms such as the bond market, the Rural Electrification Administration (REA) and the Alaska Power Authority are also available sources of funding.

Division personnel will serve primarily as Project Managers with all work carried out under contract. Contracts will be let on a competitive basis to Alaskan individuals, businesses, and other organizations such as the University of Alaska. It must be noted that in some instances it is necessary to bring in outside expertise. When this takes place, a portion of the work will be performed by an Alaskan contractor. In this way the learning experience and knowledge acquired in the process will also be retained in-State. Although the Outside expert leaves the State when completed, his or her knowledge remains. This approach has worked very successfully in several Division projects.

#### IMPLEMENTATION

Although the plan is a key element for the success of the program, there are several technologies and resources which have already been identified and can contribute greatly to solving the worsening rural energy problem and can be pursued immediately.

Because of limited time, I will briefly outline known high priority projects which deserve immediate attention during the first year of the program.

#### Wind Power

The use of wind energy as a supplemental electrical power generation and primary heat source at the community level offers one of the best near and mid-term opportunities for meeting escalating energy costs particularly for rural Alaskans.

The Nelson Lagoon Wind Demonstration Project (Attachment No. 1) has verified the technical feasibility of integrating a wind generation system into a diesel powered community electrical grid. The Division's experience with this larger (15Kw +) wind system has been verified by other federal and private wind efforts. The conclusion - the larger systems are still very much developmental in nature. Field testing and evaluation to-date has been limited and confined to a small number of sites and applications. Even more important is that the machines have not been and are not being designed to meet Alaskan conditions.

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Design, Construction and Demonstration of an Alaskan Wind Turbine  
Generation (WTG) System

Transportation and on-site construction limitations will prevent the widespread use of large wind systems in the bush. Because of this a "wind farm" concept will eventually be utilized to meet the energy needs for communities of varying sizes. It is likely that the WTG will fall within the range of 50Kw-100Kw rated capacity, although the exact size has yet to be determined.

Initial engineering and design criteria identified include:

- Electrical power generation and resistive heating capabilities
- Survival to 150 mph, -50°F temperature, high humidity and salt spray
- Transportable within C-130 (Hercules) aircraft
- Erection without need for a crane and within remote community support constraints
- High reliability with minimum maintenance functions
- Twenty-year lifetime
- Payback period of no more than seven years

The possible assembly of the wind system within Alaska will be investigated. Maintenance and support service requirements and costs will also be delineated.

It is not intended that totally new design concepts be developed under this program. Much work and effort has already been expended in this area by researchers and manufacturers of wind systems. The approach is to modify existing basic designs and engineering to meet unique Alaskan criteria.

Estimated total cost of the three-year program including manufacture and two-year testing and demonstration of the prototype unit is estimated at \$1.5 million.

Grumman Corporation's preliminary market analysis has identified an Alaskan market of wind machines under 100 Kw of up to 1600 units.

Biomass

Other very promising readily available local energy sources are biomass or plant material (Attachment No. 2). In addition to the large interior and coastal forests, thousands of tons of wood debris are found along the states waterways and coasts.

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In many communities throughout the state wood has become an extensively used supplement and often primary residential heating source. To date, the harvesting and collection of the wood has been carried out on a random and individual basis.

The use of wood as commercial fuel source is now receiving a great deal of interest and attention both in Alaska and the lower 48. Gasification and liquification of wood and other organic materials offer promise as local fuel sources for electrical power generation units now using diesel fuel.

Unless the State of Alaska initiates a major effort to include consideration of Alaskan conditions in the development of these, technologies gasification and liquifaction units will not operate successfully in the State. Because these are one of the few promising mid-term alternatives to the continued use of diesel fuel as the energy source for electrical generation in small communities, the acceleration of its development is critical. If it does not take place, the cost of diesel powered electrical generation will become unaffordable in many communities.

Although reliable and proven gasification units for remote villages are at least five to ten years in the future, a State R & D effort will assure the development and delivery of dependable and usable units. Because many of the systems handle a variety of materials under development now such as coal and peat, two other abundant alternative energy sources, development of these systems become even more attractive.

#### Biomass Gasification Project

In 1979, the Alaska State Legislature appropriated \$150,000 for Phase I of the AVEC Wood Gasification Project. (Attachment No. 3) The United States Department of Energy has also recently awarded the Division of Energy and Power Development an additional \$175,000 for continuation of the project. Phase II efficiency and endurance testing of the unit which will result in the preparation of production unit procurement specifications for a remote environment unit.

Follow-on phases include manufacturing, testing and demonstration of the Alaskan gasification unit which can run in conjunction with slightly modified existing diesel generator sets now in use throughout the State.

Simultaneous with the hardware development will be on-going resource

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inventory (with particular attention to river and beach logs), environmental analyses assessments of harvesting and transportation methods and technologies, and evaluations of total community use of the resource for power generation and other direct uses such as hot water and space heating. Market and cost/benefit analyses of system start-up, operation and maintenance will be conducted. The result will be a detailed commercialization program and schedule for production units. Also included will be a determination of in-state manufacture of some components and/or assembly.

It is estimated that total development costs including demonstration for a reliable and economic gasification system will be \$1.4 million over a five-year period.

### Solar

For many years the potential for solar energy utilization in the State was summarily discounted as unrealistic. Recent analysis and residential projects are proving these early assumptions wrong. Once again the escalation in energy costs are now making these once "exotic" systems cost effective and practical.

There are today many opportunities to achieve significant energy and dollar savings through the incorporation of both passive and active solar systems in new and existing buildings. Benefits from solar energy projects can be realized almost immediately anywhere within the State.

In order to stimulate and encourage early use of these systems in the state, three projects will be funded during year one of the program. They are:

- ° Residential Building Active Solar Demonstration Project
- ° Commercial/Institutional Building Active Solar Demonstration Project
- ° Solar Photovoltaic Demonstration Project

Approximate total cost of these projects is \$1.0 million.

Because of time limitations, I will will identify other known and promising R & D efforts which deserve serious consideration for support under the alternative energy R & D program.

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Those include in no order of priority feasibility studies and demonstration projects in the following areas:

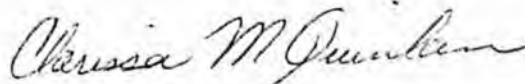
- Energy efficient bush transportation systems
- Alcohol fuels from biomass
- Peat gasification/liquifaction
- Waste heat utilization from existing small diesel generators
- Low-temperature geothermal power generation

Also being forwarded order separate cover is a listing of current energy R & D projects being carried out by the Division.

Thank you for the opportunity to respond to your inquiry and your interest in this proposed legislation.

I will be happy to answer any further questions you may have.

Sincerely,



Clarissa Quinlan  
Director

Enclosures

cc: Larry Caudle  
Bert Wagnon

# MEMORANDUM

# State of Alaska

TO: Honorable Bill Miles, Co-Chairman  
Resources Committee  
Alaska House of Representatives

DATE: March 26, 1980

FILE NO:

TELEPHONE NO:

FROM: Clarissa Quinlan, Director  
Division of Energy & Power Development  
Department of Commerce and  
Economic Development

SUBJECT: Nelson Lagoon Wind  
Demonstration Project

In response to a recent inquiry from your office, a summary of progress to date and a description of the Nelson Lagoon Wind Demonstration Project follows:

### BACKGROUND

The use of wind power as a supplemental electrical power generation source at the community level offers one of the best near to mid-term opportunities for meeting the rapidly rising energy costs facing rural Alaskans, particularly. In late 1977, the Division of Energy and Power Development initiated a demonstration project to determine the technical and economic feasibility of a wind energy conversion system operated in a remote rural community.

The concept to be addressed was the integration of a wind generation system into a diesel-powered community electrical grid. In this instance, storage of wind-generated electricity was not considered because of the costly and limited capacity of existing battery storage systems.

The energy and dollar savings from the wind-intertie approach occur through reduction of fuel usage by the diesel generators when wind power is being produced. At no time are the diesel plants completely shut down. When wind is available, the wind turbine "supplements" the diesel power system which picks up the balance of the community load.

### SEQUENCE OF EVENTS

Spring 1977 A small community diesel powered electrical system was installed in the village of Nelson Lagoon located on the lower Alaskan Peninsula. Ten homes, a community building and school were connected.

October 1977 Installation of a Grumman Windstream 25 prototype electrical wind turbine was completed. Rated at 20KW in 20 mph winds, the Windstream 25 was the sixth unit produced by Grumman Energy Systems, a subsidiary of Grumman Aerospace Corporation.

November 1977 Following sustained winds of over 75 mph for two days, a loss of two blades of the wind generator and subsequent tower failure takes place.

Two related causes for failure were identified: (1) Response of the wind system to high wind gusts results in a yawing effect as the machine turns into the gust. As the high winds continued, the blades began dipping further downward and hitting guy wires. Eventually, the stress was too great and two blades were thrown from the machine causing extreme imbalance. (2) The tower used was a radio tower previously used at Cold Bay (90 miles north) and then cut down to the desired height. Although stress and structural analyses were completed by Alaskans and Grumman engineers, the fact that the tower was not new, it is speculated that unknown fatigue points may have been present, thereby, reducing the structural integrity of the tower. (3) Substandard aircraft strength pins were used to connect the blade to the hub of the wind turbine. This finding by Grumman resulted in repercussions throughout the aircraft related operations of the company. A suit against the pin manufacturer was contemplated.

April 1978 Erection of a new 40 foot lattice tower (identical in design as first tower) and installation of a "beefed-up" Windstream 25 were completed.

June 1978  
August 1978 Electrical failures due to system short-circuits took place. Manual blade feathering mechanism were made inoperative leaving only the "speed brakes" located on the ends of each blade the only operative backup to prevent over-speeding during high wind periods. Corrosion resulting from the moisture had been identified as the cause for the repeated short-circuit. The nacelle and exposed parts of the turbine were thoroughly sealed to prevent moisture and salt spray from effecting electronic circuits.

November 1978 Following the final electrical backup failure and inability to keep out the corrosive moisture, it was determined jointly by the State and Grumman that further attempts to solve the problem would not be effective. The continued problem was attributed to an inherent design deficiency.

A "second-generation" machine was in the design stage by Grumman as part of a contract with the U.S. Department of Energy. It was decided to continue the project with this new Windstream 33. Much of the concerns and deficiencies learned in the Nelson Lagoon experience were identified and dealt with in the design of the new Windstream 33. Particular emphasis has been placed on producing a more simplified machine that can be installed, operated and maintained in a remote rural setting.

Summer 1980

The Windstream 33 will be installed and operated for at least one year as a continuation of the demonstration project.

FINDINGS

To date, the Nelson Lagoon Project has resulted in several significant findings which verify the promising future use of wind as an energy source in rural Alaska:

1. It is possible to furnish up to 90% of the villages total electrical need with wind power. During the final high-speed run of the system in August, the Windstream 25 was the primary source of electricity in the community. Prior to this time, it was not known by the engineers whether more than 40% of the total load could be provided by wind generated power.
2. High wind speeds can be endured by a large wind system in a full operational mode. The Windstream 25 and new tower sustained occasional 90 mph plus wind speeds for a period of over 24 hours while the blades were in full operational pitch. The only mechanism preventing the machine from essentially "tearing itself apart" was the speed brakes which deployed as designed. Examination of the wind turbine and tower revealed no major damage to either.
3. Larger wind turbines can be erected in a remote setting without large construction equipment such as cranes. The use of the "gin pole" as the erection device for the second unit proved very successful.

FURTHER NEEDS

It is necessary to obtain long-term operational and maintenance data from the Nelson Lagoon machine. It must be determined that the wind system is not only technically capable of enduring Alaska's harsh climate and operating conditions, but will be economically feasible as well.

Honorable Bill Miles

-4-

March 26, 1980

It is anticipated that the Nelson Lagoon Project will be the first of several demonstrations of community size wind systems of differing size, type and application.

Should you have any questions or comments, please feel free to contact me.

CQ/kkk3/12

cc: Bertram L. Magnon  
Grant Peterson

## BIOMASS IN ALASKA

May 5, 1979

Biomass includes a wide range of resources. The scope of this estimate of the biomass resources of Alaska is limited to trees, kelp, agricultural residues, and municipal wastes. Clearly, these sources are not all-inclusive. However, they are the most likely to be used in energy conversion.

TREES

Sixteen percent of the forest land in the United States is found in Alaska. Of these 119 million acres of forest located in the State, 28.2 million are classified as commercial, characterized by growth of at least 20 cubic feet/acre/year (Hutchison 1967).

Because stocking on commercial forest land in interior Alaska was often far below capacity, annual growth was only 212 million cubic feet. Hutchison estimates that the annual allowable cut for a 100-year rotation and management of these lands would be 358 million cubic feet. Using data from Hutchison and Schumann (1976), Braathe calculates an annual yield of 675 million cu. ft. from commercial forests. He estimates that, using proper management, average annual growth per acre would increase by 30 to 40 million cubic feet, raising potential commercial forest yields to one billion cubic feet per year. This higher figure did not assume peatland drainage, forest fertilization, or production from 4.6 million acres of marginal forest lands with annual growth rates of 15 to 20 cubic feet/acre.

Coastal Alaska has 13.2 million acres of forest land, of which 5.7 million are classified as commercial. Calculations using Hutchison's data reveal that coastal young-growth stands (stands in which the majority of the volume is in trees less than 150 years of age) have an average annual increment of 76 cubic feet/acre. At the time of the study, Hutchison assumed that the net growth of old-growth stands was zero. If it is assumed that gross growth is the same in new and old-growth stands, annual growth of coastal commercial forest lands (excluding 60,000 acres of nonstocked areas) is 435 million cubic feet.

Thus, summing the figures from the two regions described above provides a statewide total of between .647 billion and 1.435 billion cubic feet/year, depending upon management practices. This total includes only commercial forests, only the trees in those forests, and only the marketable portions of those trees.

While density and heating value vary with different species, the seasoned white spruce figures of 30 lbs/cu. ft. (Carol E. Lewis, U of A Agricultural Experiment Station 1978) has been used for these calculations. Moisture-free, resin-free (increases heating value) wood of any species is approximately 8,300 Btu/lb. (Corder 1973 in Grantham). The resulting range of energy available annually from the biomass sources is from  $161 \text{ Btu} \times 10^{12}$  to  $357 \text{ Btu} \times 10^{12}$ .

Non-forest and non-commercial forest areas contribute substantially to the State's biomass. Logging residue, which does not include biomass other than that from trees, is also important, as can be seen in the

figure on the following page. While figures will vary depending upon species, age, location, and other factors, a representative hemlock operation in Southeast Alaska has a logging residue of 23.3%. This included broken logs, long butts, unused volume up to an 8 inch top, volume between the used top and total height of the tree, and cut logs left in the woods (Woodfin 1976). Estimated logging residue in 1970 in coastal Alaska was 39 million cubic feet from growing stock and 27 million cubic feet from other sources.

These figures do not imply that these materials were available at a reasonable price. As is often the situation with biomass resources, the economics of collection are likely to be unfavorable. Twelve years ago, 38 percent of the 5.3 million acres of commercial forests in Alaska's coastal National Forests were classified inaccessible (Hutchison 1967).

The State's pulp and paper industry is able to absorb a large portion of the wood residue generated, although 8 million cubic feet of primary manufacturing residue (excluding bark) went unused in 1970 (Grantham, 1974). Louisiana Pacific Corporation in Ketchikan generates power from its own wood residues and also those from Ketchikan Spruce and Annette Hemlock. In Wrangell, Alaska Lumber and Pulp and Alaska Wood Products, Inc. use their residues for generation. Alaska Wood Products sells excess electricity to the town of Wrangell.

An important source of wood residue is that which washes up on the coastal shores of Alaska. While much of this occurs naturally, logs lost during river transportation are also a major contributor. It has

ABOVE  
STUMP  
COMPONENTS

TOTAL  
TREE  
COMPONENTS

TOP  
LIMBS  
31 %

TOP  
LIMBS  
25 %

BOLE  
69 %

BOLE  
55 %

STUMP,  
ROOTS  
20 %

Figure 3.14 - Component proportions of fresh weight of complete trees and stumps.

been estimated that as much as 200 million board feet may be available in Southeast Alaska. The question of legal ownership of some of the logs is one of the barriers preventing exploitation of this wood residue. A large quantity of wood that has fallen naturally into the waters of the Yukon and Kuskokwim Rivers is carried out to sea. A greater portion of these logs was once used by those living along the river for subsistence needs than is used today.

John Galea of the U.S. Forest Service has suggested the increased use of wood for fuel in the Alaskan bush. Most rural communities use expensive diesel fuel even when they live in forested areas. A pilot project could subsidize the conversion to wood and cover any costs over normal diesel expenses. Residents could gather and process the wood, providing local employment and greater control over fuel supplies (Galea 1978).

However, large scale use of wood for energy may not be practical in parts of the State. Richard Seifert estimates that an annual timber harvest of about 16,000 acres would be required to meet only one-half of the home heating requirements of the Fairbanks - North Star Borough's present population of 42,000 civilians. High grade timber covers approximately 800,000 acres of the Borough, but it is doubtful that such a high yield could be sustained (Seifert 1977).

A current example of the wood residue problem is seen in the Delta area southeast of Fairbanks. The State has agreed to clear 60,000 acres of land recently sold for agricultural purposes. It is estimated that a minimum of 1.5 million board feet of trees and stems as well as an

additional 10 tons per acre of non-sawable organic material could be recovered. Removal of this material would take with it about \$180 to \$300 worth of nutrients per acre. But even ignoring this cost, it has not been economically feasible to collect the biomass from this land (Linn 1978).

Similarly, logs are being burned on Unalaska Island after clearing river channels of log jams. Floating from Southeastern Alaska and Canada, the logs clog the rivers of the Alaska Peninsula and block the migration of salmon. The State Division of Fisheries Rehabilitation, Enhancement and Development feels it will require at least four years to complete the clearing project ("Streams Cleared for Migrating Salmon 1978).

#### KELP

Early interest in the use of the kelp for fertilizer resulted in a series of U.S. Department of Agriculture studies (ed. Frank K. Cameron Potash From Kelp, 1915). One of the articles (George B. Rigg, "The Kelp Beds of Western Alaska") estimated the standing kelp stocks in Western Alaska to be 3,567,000 tons. Estimates from "Standing Stocks of Kelp on the American Pacific Coast" (USDA 1915) set Western Alaskan standing stocks at 2,437,000 and Southeastern standing stocks at 7,833,000.

Since Alaskan waters have remained relatively unpolluted, C. Peter McRoy of the University of Alaska's Institute of Marine Science states that these early estimates of the Alaskan Pacific kelp resources are probably still valid (1971). He goes on to place the potential kelp harvest for

the complete state at two million tons [assumed to be dry annual harvest].

This large harvest is possible due to the rapid rate of growth characteristic of many species of kelp. Experiments on eelgrass found in Southeast Alaska shows a growth rate of 27 grams dry weight per square meter on days with 15 hours of productivity (McRoy 1970). This corresponds roughly to the Danish study which doubled the maximum standing stock to approximate annual eelgrass production (Petersen 1914).

Standing crops range up to five kilograms per square meter (McRoy 1971). The productivity of these beds is highly dependent on the methods of harvest. Kelp is harvested as a Japanese delicacy in Bristol Bay and Prince William Sound. The recently prohibited practice of raking the kelp into the boats not only pulled the kelp out by the roots, but also caused substantial disruption of the ocean floor. For the last couple years, hand harvesting has been required, permitting selective cutting of commercial species and regrowth of harvested plants (Haanpaa, Alaska Division of Commercial Fisheries, May 1, 1979).

Eelgrass dries to about one ninth of its fresh weight. The leaves contain 4211 calories per ash free gram and the roots and rhizomes contain 3571. Unfortunately, ash comprises 20 percent of the dry weight (McRoy 1970). Thus, an annual kelp harvest could provide  $33.36 \text{ Btu} \times 10^{12}$ .

## AGRICULTURAL

Due to the climate of Alaska, agriculture is not a major source of biomass for the State. An estimate of the number of acres devoted to the major Alaskan crops in 1978 is given below:

<u>CROP</u>	<u>ACRES</u>	<u>PRINCIPAL AREA</u>
Barley	4,000	Delta, Matanuska Valley
Oats	600	
Hay	13,000	
Silage	2,400	
Vegetables	1,000	
Rayse & Wheat	1,000	
Grass Seed	125	

(DeLon Brown, U.S. Department of Agriculture, May 2, 1979).

While different crops and growing conditions will clearly alter the quantity and quality of biomass available, cereal and grass seed crops produce two to three tons of clean collectable residue per acre. Applying an average of 2.5 tons per acre to Alaskan fields yields 44,250 tons of biomass.

At harvest straw moisture is only 10-15 percent (Thomas R. Miles 1978). Yielding 7500 Btu/lb at 10% moisture (The Science and Public Policy Program, University of Oklahoma 1975), Alaskan crop residues could provide approximately 664,000 MMBtu.

Brown estimated 1978 livestock levels in the State to be:

<u>LIVESTOCK</u>	<u>NUMBER</u>	<u>PRINCIPAL AREAS</u>
Cattle	8,500	Kenai, Aleutians Matanuska Valley
Hogs		
Dec. 1	1,100	Matanuska Valley
Summer	2,200	Tanana Valley
Sheep	5,500	Aleutians
Chickens		
Dec. 1	28,000	
Summer	100,000	

The manure from 8,500 cattle could be used to generate .34 MMCF per day of gas (Elizabeth Coppinger 1978) with a heating value of approximately 600 Btu per cubic foot.

Arbitrarily assigning manure levels of 15 percent of that of cattle for hogs, 10 percent for sheep and 1 percent for chickens, brings the total Btu's obtainable by gasification to approximately 87,000 MMBtu annually.

#### Solid Waste

Refuse derived fuel is one energy source which is likely to increase in Alaska due to population growth. Metcalf & Eddy, Inc. completed a solid waste resource recovery study for the Municipality of Anchorage, Elmendorf Air Force Base, and Fort Richardson in January 1979.

They found that 4.59 lb/capita/day of refuse (1977) were generated in the Anchorage Bowl study area. From the population of 215,101 in the area, 360 million pounds of solid waste must be disposed of annually. The raw refuse has a heating value of 6,013 Btu/lb. Even without increasing the heating value by separating non-combustible (and often

recyclable) components, the refuse derived fuel provides 2.168 Btu x 10<sup>12</sup>. With specified conditions, the study concludes that solid waste resource recovery is economically feasible.

Assuming that solid waste generation per person is consistent throughout the State, the energy potential for the 403,000 population (State Division of Economic Enterprise, September 1, 1978) is 4.063 Btu x 10<sup>12</sup>.

### CONCLUSION

Below is a summary of the potential energy annually available from biomass sources in Alaska:

<u>Source</u>	<u>10<sup>12</sup> Btu/Year</u>
Forests	
Present growth rate	161.
Minimal management (Hutchison)	197.
Non-intensive management (Braathe)	357.
Kelp	33.
Agriculture	
Crop	.664
Animal	.087
Solid Waste	4.063
	<u>235.</u>

As noted in the discussion of trees, this estimate is low in that many biomass resources were not included. It is high in the practical sense that it is not economically, socially, or environmentally desirable to collect all available biomass for energy conversion. All of the above resources have non-energy applications and costs which must be considered. Still, the State's potential is enormous and merits additional attention.

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## AVEC WOOD GASIFICATION PROJECT

1. Background:

A. Problem: There are some 200 small communities across Alaska that currently have no electricity, or where they have electricity, costs are currently in the order of 40¢ per kWh for residential consumers and will soon be higher with scheduled further oil price increases by OPEC and other major suppliers. This is the highest cost in the Nation and is some ten times the National average. These high rates are discouraging to improved health, educational, and living standards of the people involved, and are causing cutoffs through inability to pay, both for older people and to vital public facilities such as water and sewer systems. The high costs in outlying areas are due to a number of factors, including high construction costs, loss of all economy of scale in power generation, high costs of outside maintenance support requirements, relatively low thermal efficiency of small size diesel units in the typical load profile experienced, and the very high costs of diesel fuel delivered over a high cost and seasonal transportation system.

B. Potential: AVEC is looking at a number of possible alternate energy sources. Biomass conversion has particular appeal in that it offers a possibility of a system that could operate 24

hours a day, 365 days a year, utilizing a renewable resource in the form of wood which could be grown and processed locally. In addition, the project could create local jobs in areas with high unemployment. This would have the double benefit of injecting dollars into the local economy, and reduce national petroleum requirements and resultant balance of payment deficits for oil procurement. Wind systems require substantial alternate backup systems to fill in during the gaps when the wind is not blowing strong enough or is blowing too strong, and therefore must be evaluated strictly on a fuel substitute basis, rather than as a complete alternate system to supply the typical village load as it has developed. Hydro projects are limited to only a few locations and involve extremely high capital costs including transmission lines. This has limited the feasibility of connecting communities together.

The intent is to perfect a biomass converter which will provide a reliable and efficient source of energy conversion for use in generation of electricity and other energy needs for moderate sized communities in rural areas of Alaska or other isolated locations around the world where the cost of transmission lines to tie into central power grids is prohibitive. In order to achieve this, it is necessary to develop and test a unit that is: a) reliable, b) relatively simple to operate, c) capable of operating unattended for periods of up to 24 hours, d) has minimized maintenance

consisting primarily of carbon monoxide, hydrogen, and methane, which in turn can be used either for direct combustion or with internal combustion engines.

The initial project has been funded for \$150,000.00 by the State of Alaska. AVEC will put up, in addition, approximately \$25,000.00 of funds for this project through the very preliminary phases. It should be noted, however, that AVEC has the highest electric rates of any REA cooperative in the Nation, and has substantial demands on its cash flow just to meet the new higher prices of fuel each year. There is not even sufficient margin generated at the current time to even pay for the increased replacement cost of fuel each year. Therefore, it is not desirable that AVEC put much money into this type of project irrespective of the promise, given the very demanding situation at present just to survive with the current high costs and rates. Therefore, additional outside support is required to investigate these promising alternate energy resources.

On January 18, 1980, a test was initiated at Biomass, Inc. Yuba City, California to operate a new design gasifier for use in small rural communities in Alaska. The gasifier was plumbed to a G353 Caterpillar generator set, modified to operate on a low BTU gas. The test was performed with wood chips (Ponderosa pine) for fuel.

requirements and simple so they can be performed almost 100% at the local level, e) include the necessary safety systems to reduce possibility of accidents, f) improved overall thermal efficiency at various output profiles and take maximum advantage of waste heat generated, g) using a variety of fuels to establish thermal efficiency and associated operational limitations, h) establish that air quality standards can be maintained with the unit under a variety of loads, fuels, and start up and slow down conditions, and i) investigate all aspects of required fuel procurement, transportation, handling, and related economics.

## 2. History of Current Project:

A. The current project was conceptualized in the spring of 1979 when information became available on a new type of downdraft gasifier being developed by Biomass Corp. in Yuba City, California. While there have been other small scale biomass converters developed through the years, this unit seemed to offer particular promise with ability to meet tight air pollution standards within the State of California. The University of California-Davis has been doing extensive work in this area in order to develop the units to use primarily for agricultural waste. The unit does have excellent potential to use wood chips, as well as peat and coal, for conversion to producer gas. This is a relatively low Btu gas

The gasifier required approximately 20 minutes to build sufficient gas to operate the engine. The engine was started and time set for the low BTU gas operation. The test included operation under load with an electrical load bank. In operation the units produced 115 KW continuous output with the gasifier at full capacity. After testing, the engines spark plugs indicated the scrubber was not operating correctly allowing tars to pass through and into the combustion chambers. This was unsatisfactory for operations and full acceptance was rejected until modifications of the scrubber could be accomplished.

Final acceptance after scrubber modifications is to be held the week of March 10, 1980.

3. Statement of Work:

The objective of the efficiency and endurance testing phase is to optimize a biomass gasifier which will operate reliably and efficiently in the production of electricity and heat in rural Alaska. We expect to be prepared to start the testing by May 1980, utilizing the gasifier and engine generator purchased during the first phase of the project. Efficiency and endurance testing will be conducted as follows:

- 1) Select the most suitable fuel which can be made available at the source of village generation at the lowest predicted overall cost averaged over 25 years per Btu of output.

- 2) Procure enough fuel and storage capability to conduct a sustained endurance test of 3 months.
- 3) Select the most suitable unit based on Phase I or other evaluation data available to conduct sustained endurance test.
- 4) Define test requirements and obtain all required instrumentation for sustained endurance test.
- 5) Conduct 3 month sustained endurance test 24 hours per day (manned 50 if time).
- 6) Write endurance test report together with all recommended design changes.
- 7) Prepare production unit procurement specifications to obtain optimum reliability, efficiency, maintainability, and durability.
- 8) Investigate all aspects of converting gasification/power generation waste heat for community use.
- 9) Prepare written report detailing findings, conclusions, and recommendations including costs and timetables for subsequent phases of the program. Develop fifteen (15) minute audio/visual presentation of the project to date.

Organization:

The Division of Energy and Power Development will retain total project responsibility with Loyd Hodson, General Manager of Alaska Village Electric Cooperative (AVEC), continuing as Project Manager through a subcontract with the Division.

Budget:

Phase I and II will be equally cost-shared by the State of Alaska and the Federal Government.

- A. Phase I - Construction and completion of initial gasifier tests in Yuba City, California. Installation of unit in Anchorage, Alaska.

State of Alaska	\$150,000.00
AVEC	<u>25,000.00</u>
	\$175,000.00

- B. Phase II - Alaska efficiency and endurance testing Anchorage, Alaska. Preparation of production unit procurement specifications.

United States Department of Energy	\$175,000.00
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FISCAL NOTE

I. REQUEST

Bill/Resolution No. SB 528 and SB 529  
 Title "An Act Relating to Alternative Energy Research Development and Demonstration."  
 Requested by \_\_\_\_\_ Date 4/10/80

II. FISCAL DETAIL

Agency Affected Department of Commerce and Economic Development  
 Program Category Affected Development  
 BRU, Program, or Subprogram(s) Affected Division of Energy and Power Development  
 (Note: If more than one budget component is affected, separate line item amounts and funding for each component in the analysis section.)

EXPENDITURES (Thousands of Dollars)

	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85
100 PERSONAL SERVICES		237.4	256.4	276.9	299.0	322.9
200 TRAVEL		14.4	19.5	21.0	23.0	26.0
300 CONTRACTUAL		130.1	113.5	122.6	132.4	143.0
400 COMMODITIES		4.8	2.4	2.6	3.8	4.9
500 EQUIPMENT		6.0	.5	.7	1.0	1.0
600 LAND & STRUCTURES						
700 GRANTS, CLAIMS, ETC.						
<b>TOTAL</b>		<b>392.7</b>	<b>392.3</b>	<b>423.8</b>	<b>459.2</b>	<b>497.8</b>

FUNDING (Thousands of Dollars)

\*Note: 8% inflation factor and \$5 million annual appropriation assumed for subsequent years

	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85
GENERAL FUND						
FEDERAL FUNDS						
OTHER (Specify Fund Source)						

POSITIONS

	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85
FULL TIME						
PART TIME						
TEMPORARY						

III. ANALYSIS (See Fiscal Note Preparation Instructions, Section III)

The budget outlined reflects the costs over and above the division's FY '81 capital budget. The request covers the administration, contracting, granting, program development, review reporting and monitoring of funds allocated for projects. It also covers additional workload for development of an Alternative Energy Development Plan.

The budget is designed around a \$5 million funding level as specified in SB 529

REVISOR: \_\_\_\_\_  
 IV. DATE April 11, 1980 REVISOR: \_\_\_\_\_  
 PREPARED BY David Creekman  
 AGENCY Department of Commerce & Economic Development  
 PHONE 465-2504  
 Original: Legislative Finance  
 cc: Budget and Management  
 Prime Sponsor (First Legislator Named)

Alternative Energy Research Development and Demonstration

100	<u>Personal Services</u>		<u>\$237,415.00</u>
	1 Energy Program Coordinator (Range 23A) @ \$3,746/mo. x 12 months plus 25.5% payroll burden	\$56,414.00	
	1/2 Energy Administrator (Range 21) @ \$3,260/mo. x 6 months plus 25.5% payroll burden (other 1/2 to be covered in Division FY '81 Capital Budget request)	24,548.00	
	1 Grant Administrator (Range 17) @ \$2,455/mo. x 12 months plus 30% payroll burden	36,972.00	
	1 Accounting Technician 1 (Range 12) @ \$1,761/mo. x 12 months plus 30% payroll burden	27,472.00	
	2 Energy Specialist I (Range 16) 2 @ \$2,991/mo. x 12 months plus 30% payroll burden	69,005.00	
	1 Clerk Typist III Range 09A) @ \$1,475/mo. x 12 months plus 30% payroll burden	23,004.00	
200	<u>Travel</u>		<u>\$ 14,440.00</u>
	4 trips @ \$600.00 = \$2,600.00		
	16 days per diem @ \$65 = \$1,040.00		
	12 trips @ \$210.00 = \$2,520.00		
	36 days per diem @ \$65 = \$2,340.00		
	2 trips @ \$300.00 = \$3,600.00		
	36 days per diem @ \$45 = \$2,340.00		
300	<u>Contractual</u>		<u>\$130,100.00</u>
	Professional Services - Technical review of profits and program development	83,600.00	
	Other - Telephone, postage, printing, copying, advertising, equipment rental, space rental	46,500.00	
400	<u>Commodities</u>		<u>\$ 4,800.00</u>

500 Equipment\$ 6,009.28

5 file cabinets @ \$210.00	1,050.00
3 book shelves @ \$ 90.00	270.00
1 calculator @ \$240.00	240.00
2 tables @ \$145.00	290.00
5 chairs @ \$ 76.46	382.30
1 desk @ \$380.00	380.00
1 credenza @ \$309.00	309.00
3 desks @ \$387.70	1,163.10
1 typewriter @ \$902.48	902.48
1 Lanier dictation machine @ \$511.35	511.35
1 Lanier transcriber @ \$511.35	511.35

TOTAL

\$392,764.28

**CATEGORY:** DEVELOPMENT  
**PROGRAM:** ECONOMIC DEVELOPMENT

**AGENCY:** COMMERCE AND ECONOMIC DEVELOPMENT  
**BRU (s):** ENERGY AND POWER DEVELOPMENT

The goal of the Energy and Power Development BRU is to assure Alaskan residents and businesses of an adequate supply of energy at a reasonable cost with minimum impact on the environment. Emphasis is placed on using the State's vast quantity of primary energy resources to increase the supply provided by in-state sources. Energy conservation and alternative energies are also given considerable attention. The Components include Energy Administration; Energy Conservation Program; Energy Extension Service; and Weatherization, which are all in the Division of Energy and Power Development. The Division's key activities include:

**Energy Planning:** The Division assesses Alaska's energy supply and demand in order to provide a sound data base for decision making. Potential sources of energy are inventoried and criteria for development determined. Knowledge of energy demand by user and end-use allows optimal matching between supply and demand. The FY 81 operating budget includes an increase of \$70,000 and the capital budget \$100,000 for assessments of energy supply and demand.

**Rural Energy:** Rural villages are more vulnerable to disrupted energy supplies and usually experience higher costs than urban areas of Alaska. Provision of bulk fuel storage tanks can alleviate some of the problems associated with fuel oils. The Division monitors rural energy problems, identifies solutions, and implements these solutions (i.e., locating surplus bulk fuel storage tanks) when possible. The FY 81 budget includes an increase of \$120,800 to coordinate the rural energy program.

**Alternative Energy:** Alternative energy technologies offer significant potential for small and dispersed energy users. However, these technologies must demonstrate cost-effective operation under Alaskan conditions. The Division receives federal and state funding (\$550,000 of G.F. in FY 81 capital budget) for the demonstration of existing hardware relative to Alaskan conditions. Once proven, the Division will depend on the private sector for market development. The Division does not attempt to undertake basic research efforts.

**Energy Conservation:** The Energy Extension Service, State Energy Conservation Program and Weatherization Program are federally funded programs which provide public information and assistance to reduce energy consumption in residential and commercial buildings. The FY 81 capital budget includes \$1,770,000 federal funds and \$805,000 state match for energy conservation projects. The Weatherization Program was in the Social Services category with the Department of Community and Regional Affairs in FY 80.

COMPONENT DESCRIPTION	79 AUTH	79 FINAL	79 ACT	80 AUTH	80 SUPL	80 RP	GOVERNOR
ENERGY ADMINISTRATION	356.9	383.2	373.7	299.2		132.2	513.7
ENERGY CONS	385.9	476.8	408.2	330.0			468.7
ENERGY EXTENSION SERVICE		15.0		296.7		225.2	419.6
WEATHERIZATION						138.4	2488.0
<b>** TOTAL</b>	<b>742.8</b>	<b>875.0</b>	<b>781.9</b>	<b>925.9</b>		<b>495.0</b>	<b>3890.0</b>
<b>** CHANGE VERSUS 80 AUTH</b>							<b>80.6%</b>
<b>OBJECT DESCRIPTION</b>							
PERS. SERV.	425.2	504.9	492.9	515.9		132.2	791.0
TRAVEL	49.8	52.0	28.0	38.4		66.8	103.9
CONTRACTUAL	252.1	304.4	252.1	344.5		235.7	702.2
COMMODITIES	6.5	7.7	6.9	6.3		6.6	21.0
EQUIPMENT	9.2	6.0	2.0	2.8		25.1	12.4
GRANTS, CLMS	-0-	-0-	-0-	-0-		29.4	2259.5
MISC.				18.0			
<b>FUNDING SOURCE</b>							
FED. RECEIPT	-0-	15.0	-0-	626.7		495.0	3250.5
G.F. MATCH							125.8
GENERAL FUND	742.8	860.0	781.9	299.2			513.7
<b>** GENERAL FUND CHANGE VS. 80 AUTH</b>							<b>113.7%</b>
<b>POSITIONS</b>							
FULL-TIME	14.0	14.0	14.0	17.0		2.0	29.7
PART-TIME							2.0
STAFF MONTHS	168.0	168.0	168.0	204.0		27.0	344.0

FISCAL NOTE

I. REQUEST  
 Bill/Resolution No. SB 528 and SB 529  
 Title "An Act related to Alternative Energy Research Development and Demonstration"  
 Requested by Rules Committee Date 3/31/80

II. FISCAL DETAIL  
 Agency Affected Department of Commerce and Economic Development  
 Program Category Affected Development  
 BRU, Program, or Subprogram(s) Affected Division of Energy and Power Development  
 (Note: If more than one budget component is affected, separate line-item amounts and funding for each component in the analysis section.)

EXPENDITURES (Thousands of Dollars)

	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85
100 PERSONAL SERVICES		181.0	195.5	211.1	22.0	246.2
200 TRAVEL		14.4	19.5	21.0	23.0	26.0
300 CONTRACTUAL		130.1	113.5	122.6	132.4	143.0
400 COMMODITIES		4.8	2.4	2.5	3.8	4.9
500 EQUIPMENT		6.0	.5	.7	1.0	1.0
600 LAND & STRUCTURES						
700 GRANTS, CLAIMS, ETC.						
TOTAL		336.3	331.4	358.1	182.2	421.1

FUNDING (Thousands of Dollars)

\*NOTE: 8% inflation rate and \$5 million annual appropriation assumed for subsequent years.

	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85
GENERAL FUND						
FEDERAL FUNDS						
OTHER (Specify Fund Source)						

POSITIONS

	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85
FULL TIME		5	5	5	5	5
PART TIME						
TEMPORARY						

III. ANALYSIS (See Fiscal Note Preparation Instructions, Section III)

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The Budget is designed around a \$5,000,000 funding level as specified in SB 529.

Alternative Energy Research, Development and Demonstration

100 Personal Services \$ 181,001.00

1/2 Energy Administrator (Range 21)  
 @ 3,260/mo. X 6 months plus 25.5%  
 payroll burden \$ 24,548.00

(other 1/2 to be covered in Division FY81  
 (other 1/2 to be covered in Division  
 FY81 Capitol Budget request)

1 Grant Administrator (Range 17)  
 @ \$2,455/mo. X 12 months plus 30%  
 payroll burden 36,972.00

1 Accounting Technician I (Range 12)  
 @ \$1,767/mo. X 12 months plus 30%  
 Payroll burden 27,472.00

2 Energy Specialists I (Range 16)  
 2 @ \$2,291/mo. X 12 months plus 30%  
 Payroll burden 69,005.00

1 Clerk Typist III (Range 09a)  
 @ \$1,475/mo. X 12 months plus 30%  
 Payroll burden 23,004.00

200 Travel

4 trips @ \$600.00 = \$2,600.00

16 days per diem @ \$65 = \$1,040.00

12 trips @ \$210.00 = \$2,520.00

36 days per diem @ \$65 = \$2,340.00

2 trips @ \$300.00 = \$3,600.00

36 days per diem @ \$45 = \$2,340.00

300 Contractual \$ 130,100.00

Professional Services - Technical Review  
 of profits and program development 83,600.00

Other - Telephone, postage, printing,  
 copying, advertising, equipment rental,  
 space rental 46,500.00

400 Commodities

\$ 4,800.00

500 Equipment

5 File cabinets @ \$210.00	\$ 1,050.00
3 Book shelves @ \$ 90.00	270.00
1 Calcuator @ \$240.00	240.00
2 Tables @ \$145.00	290.00
5 Chairs @ \$ 76.46	382.30
1 Desk @ \$380.00	380.00
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3 Desks @ \$387.70	1,163.10
1 Typewriter @ \$902.48	902.48
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**CATEGORY:** DEVELOPMENT

**AGENCY:** COMMERCE AND ECONOMIC DEVELOPMENT

**PROGRAM:** ECONOMIC DEVELOPMENT

**BRU (s):** ENERGY AND POWER DEVELOPMENT

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**Energy Planning:** The Division assesses Alaska's energy supply and demand in order to provide a sound data base for decision making. Potential sources of energy are inventoried and criteria for development determined. Knowledge of energy demand by user and end-use allows optimal matching between supply and demand. The FY 81 operating budget includes an increase of \$70,000 and the capital budget \$100,000 for assessments of energy supply and demand.

**Rural Energy:** Rural villages are more vulnerable to disrupted energy supplies and usually experience higher costs than urban areas of Alaska. Provision of bulk fuel storage tanks can alleviate some of the problems associated with fuel oils. The Division monitors rural energy problems, identifies solutions, and implements these solutions (i.e., locating surplus bulk fuel storage tanks) when possible. The FY 81 budget includes an increase of \$128,800 to coordinate the rural energy program.

**Alternative Energy:** Alternative energy technologies offer significant potential for small and dispersed energy users. However, these technologies must demonstrate cost-effective operation under Alaskan conditions. The Division receives federal and state funding (\$550,000 of G.F. in FY 81 capital budget) for the demonstration of existing hardware relative to Alaskan conditions. Once proven, the Division will depend on the private sector for market development. The Division does not attempt to undertake basic research efforts.

**Energy Conservation:** The Energy Extension Service, State Energy Conservation Program and Weatherization Program are federally funded programs which provide public information and assistance to reduce energy consumption in residential and commercial buildings. The FY 81 capital budget includes \$1,770,000 federal funds and \$885,000 state match for energy conservation projects. The Weatherization Program was in the Social Services category with the Department of Community and Regional Affairs in FY 80.

COMPONENT DESCRIPTION	79 AUTH	79 FINAL	79 ACT	80 AUTH	80 SUPL	80 RP	GOVERNOR
ENERGY ADMINISTRATION	356.9	383.2	373.7	299.2		132.2	513.7
ENERGY CONS	385.9	476.8	408.2	330.0			468.7
ENERGY EXTENSION SERVICE		15.0		296.7		225.2	419.6
WEATHERIZATION						138.4	2488.0
** TOTAL	742.8	875.0	781.9	925.9		495.8	3890.0
** CHANGE VERSUS 80 AUTH							80.6%
OBJECT DESCRIPTION							
PERS. SERV.	425.2	504.9	492.9	515.9		132.2	791.0
TRAVEL	49.8	52.0	28.0	38.4		66.8	103.9
CONTRACTUAL	252.1	304.4	252.1	344.5		235.7	762.2
COMMODITIES	6.5	7.7	6.9	6.3		6.6	21.0
EQUIPMENT	9.2	6.0	2.0	2.8		25.1	12.4
GRANTS, CLMS	-0-	-0-	-0-	-0-		29.4	2259.5
MISC.				18.0			
FUNDING SOURCE							
FED. RECEIPT	-0-	15.0	-0-	626.7		495.8	3250.5
G.F. MATCH							125.8
GENERAL FUND	742.8	860.0	781.9	299.2			513.7
** GENERAL FUND CHANGE VS. 80 AUTH							113.7%
POSITIONS							
FULL-TIME	14.0	14.0	14.0	17.0		2.0	29.7
PART-TIME							2.0
STAFF MONTHS	168.0	168.0	168.0	201.0		27.0	344.0

Introduced: 3/21/80  
Referred: Finance

BY THE RULES COMMITTEE BY  
REQUEST OF THE LEGISLATIVE  
COUNCIL BY REQUEST

1 IN THE SENATE

2 SENATE BILL NO. 528

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 ELEVENTH LEGISLATURE - SECOND SESSION

5 A BILL

6 For an Act entitled: "An Act relating to alternative energy research, de-  
7 velopment, and demonstration."

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

9 \* Section 1. PURPOSES. The purposes of this Act are to

10 (1) stimulate research, development, and demonstration of alterna-  
11 tive energy sources;

12 (2) lessen reliance on nonrenewable energy sources; and

13 (3) provide for the financing of research, development, and  
14 demonstration of alternative energy sources.

15 \* Sec. 2. AS 45.88 is amended by adding new sections to read:

16 ARTICLE 2. ALTERNATIVE ENERGY RESEARCH,  
17 DEVELOPMENT, AND DEMONSTRATION GRANTS.

18 Sec. 45.88.050. ALTERNATIVE ENERGY RESEARCH, DEVELOPMENT, AND  
19 DEMONSTRATION FUND. There is established in the Department of Commerce  
20 and Economic Development the alternative energy research, development,  
21 and demonstration fund. The fund shall be administered by the depart-  
22 ment. The fund may be financed by appropriation.

23 Sec. 45.88.060. POWERS OF DEPARTMENT. The department may

24 (1) employ staff to administer AS 45.88.050 - 45.88.100;

25 (2) retain professional consultants and advisors;

26 (3) adopt regulations and procedures to administer the fund;

27 (4) consider applications for grants and make grants for

28 projects that will further the purposes of AS 45.88.050 - 45.88.100;

29 Sec. 45.88.070. APPLICATIONS FOR GRANTS. A person may apply to

1 for the next five years for the research and development of alternative  
2 energy; and

3 (2) the method to be used by the department to achieve those  
4 objectives.

5 Sec. 45.88.090. REPORTS. The department shall report its expendi-  
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7 lature by the 20th day of each regular legislative session. The depart-  
8 ment shall include in its report an assessment of its progress during  
9 the previous year in meeting the short-term and long-term objectives in  
10 the plan prepared under AS 45.88.085.

11 Sec. 45.88.100. DEFINITIONS. In AS 45.88.050 - 45.88.100,

12 (1) "alternative energy" means a form of energy, other than  
13 hydroelectric energy or energy from oil or natural gas, which is  
14 renewable, including but not limited to solar energy, wind energy,  
15 energy from methane produced from solid waste, or energy from other  
16 sources which are not widely used on a commercial basis; "alternative  
17 energy" also means energy conservation methods which are not widely used  
18 on a commercial basis, including but not limited to fuel cells;

19 (2) "department" means the Department of Commerce and  
20 Economic Development;

21 (3) "fund" means the alternative energy research, develop-  
22 ment, and demonstration fund.

23 (4) "small community" means a city, borough or unincorporated  
24 area which has a population of less than 5,000 according to the latest  
25 United States census figures or according to estimates of population  
26 certified as correct by the Department of Community and Regional  
27 Affairs.

# **CORRECTION**

**THIS DOCUMENT  
HAS BEEN REPHOTOGRAPHED  
TO ASSURE LEGIBILITY**

Introduced: 3/21/80  
Referred: Finance

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1 the department for a grant to conduct research in, to develop, or to  
2 demonstrate alternative energy sources. The department shall prescribe  
3 the form for applications. An applicant shall describe the nature of his  
4 proposed research, development, or demonstrations, including practical  
5 applications of possible results, the time which will be required to  
6 complete the research, development, or demonstration, and the potential  
7 for using the results of the research, development or demonstration in  
8 various areas of the state.

9 Sec. 45.88.080. CRITERIA FOR GRANTS. The department may make  
10 grants to applicants under AS 45.88.070 according to the following  
11 criteria:

12 (1) the department shall give preference to a project if, in  
13 the opinion of the department, the possible results of the project will  
14 provide benefits or information which are useful in all areas of the  
15 state;

16 (2) the department may give preference to a project which is  
17 also supported by grants from the federal government or from other  
18 persons if the other grants are consistent with the purposes expressed  
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20 (3) the department shall give preference to a project which  
21 makes information available to individuals, families, small businesses,  
22 and small communities on the use of alternative energy sources in their  
23 homes, plants, places of business, and small communities;

24 (4) the department shall notify the recipient of a grant that  
25 the information resulting from the research, development, or demonstra-  
26 tion shall be public and is not the private property of any person;

27 Sec. 45.88.085. ALTERNATIVE ENERGY PLAN. The department shall  
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2 energy; and

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HAROLD H. GALLIETT, JR.  
REGISTERED CIVIL ENGINEER

APR 23 1980

B

REPORTS  
SURVEYS  
DESIGN  
SUPERVISION

18 April 1980

746 F STREET  
ANCHORAGE, ALASKA 99501  
272-9212  
279-3226

SB 528 ALT ENERGY RESEARCH  
IN SEN

Honorable John C. Sackett  
Alaska State Senate  
Pouch V  
Juneau, Alaska 99811

Subject: Suggested Changes To  
Senate Bill No. 528

Dear Senator Sackett:

I have studied the inclosed copy of Senate Bill No. 528, which bill has been referred to your Senate Finance Committee.

This bill may help to reduce our reliance on oil and natural gas, which are becoming less-available, less-reliable and more-expensive.

Please permit me to recommend two changes, as follows:

1. In Section 1, PURPOSES, Paragraph (2), change the present words, "nonrenewable energy sources" to the new words, "oil and natural gas."
2. In Sec 45.88.100, DEFINITIONS, Paragraph (1), change the present paragraph to the new paragraph shown on the attached legal-size sheet.

My basic reasoning for these suggested changes is as follows:

1. Requiring "alternative energy" to be "renewable" is unduly restrictive. Peat, which may not be considered renewable, and coal, which is not considered renewable, offer excellent subjects for alternative energy research, development and demonstration projects to benefit our smaller communities. Personally, I favor converting village heating and power generation to wood, where wood is competitive. However, precluding research grants for peat and coal might hurt many villages where these are the most economical or only fuels available.

"Renewable" is an environmental cliché which is substituted for rational consideration of all alternatives.

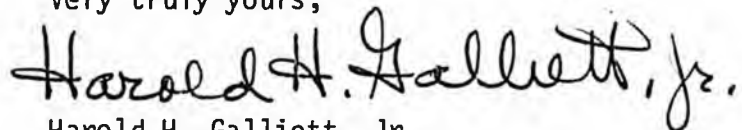
2. There are several research projects in small hydroelectric machines, methods and sites which should not be precluded by a definition which excludes hydroelectric power as "alternative energy." Sometimes a small hydro device or site can be combined with wood gasification or gas turbine power generation to yield outstanding economy. We should not limit rational consideration of all alternative energy resources.

Our goal should be to reduce our dependence on oil and natural gas, not to mandate blind adherence to "renewable" resources.

A broadened definition of "alternative energy" will best achieve the purposes of this proposed legislation.

Thank you for considering this suggestion.

Very truly yours,



Harold H. Galliett, Jr.,  
Registered Civil Engineer

HG:mg

Introduced: 3/21/80  
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