

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672

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Figure 4.6: Case "B" Assumptions (Residential Space Heat)

1. Single Family Dwellings:
 - (a) Pre-1980 stock and 1985 stock retrofit so as to achieve improvement in efficiency of 4% per 5-year period compared to base 1980 and base 1985 requirements, stabilizing at 80% of base requirements
 - (b) Base heating requirements for 1990 and successive stock vintages decrease as follows:

1990 -	35000 kWh	(based on 1980 house size)
1995 -	30000	"
2000 -	25000	"
2005 -	20000	"
2010 -	20000	"
 - (c) unit size increases to 1.15 x 1980 value by 1995, then remains stable
 - (d) 1985 stock has a (1 - Cs) of 0.95 (as per ISER); all other stock has a (1 - Cs) of 1.0 (conservation is accommodated through reductions to base requirements as per (b) above)
2. Duplexes:
 - (a) retrofit as per single family dwellings
 - (b) Base heating requirements for 1990 and successive stock vintages decreases as follows:

1990 -	23600 kWh	(based on 1980 house size)
1995 -	20600	"
2000 -	17600	"
2005 -	14600	"
2010 -	14600	"
 - (c) unit size increases to 1.2 x 1980 value by 2000, then remains stable
 - (d) conservation treated as per single family dwellings
3. Multi-Family Dwellings:
 - (a) all assumptions as per Case "A"
4. Mobile Homes:
 - (a) all assumptions as per Case "A"

These Case "B" modifications to the ISER residential space heat forecast result in a growth reduction from ISER's 3.77% per annum to 1.77% per annum throughout the forecast period, a 53% reduction.

(X)

4.3.2 Major Residential Appliance Energy Requirements

Although ISER's model incorporates the effects of federally mandated appliance efficiency improvements, analysis by others has indicated that even greater gains are possible in this area. While the potential improvements in individual appliances vary greatly, it seems reasonable to suggest that on average, improvements in the range of 20% over and above present federal standards are possible. Thus, by using ISER's aggregate major appliance consumption data, and factoring in a 5% improvement by 1985; 10% by 1990; 15% by 1995; and 20% by 2000, a revised estimate of major appliance consumption can be developed. Such improvements would serve to reduce major appliance energy consumption growth from ISER's (and Case "A"'s) 3.17% per annum to 2.41% per annum throughout the entire forecast period.

4.3.3 Unspecified Residential Appliance Requirements

Again; because of the lack of appliance disaggregation in this category, it is impossible to deal explicitly with the effects of increasing saturation and improved unit efficiencies. However, by holding lighting requirements constant at 1000 kWh per year and allowing other appliance use to increase at a compound rate of 2% per annum per household, we believe we can present a reasonable estimate of the combined potential effects of both improved efficiency and growing saturation.

This would yield an annual growth rate in this end use of 4.26% compared to ISER and Case "A" growth of 4.9% per annum.

4.3.4 Residential Summary

The overall effect of the application of Case "B" assumptions to the ISER end use model is to reduce Anchorage residential sector growth from 3.75% per annum to 2.7% per annum throughout the 1980 - 2010 period.

4.3.5 The Commercial-Industrial-Government Sector

For our Case "B" scenario, we have assumed CIG data values as follows:

- (a) per employee electricity utilization remains constant after 1985 at the 1985 level of 15.156 MWh. This value can be interpreted in two ways, as either accommodating a growing number of applications at increased efficiency or as accommodating the same number of applications at current levels of efficiency (or, of course, as a combination of these two factors).
- (b) retrofitting on all vintages of stock is assumed to proceed at 5% per 5-year period over the base figure.

The effect of these assumptions is to reduce CIG sector consumption growth from ISER's 4.18% to 2.71% per annum.

4.3.6 Summary of Case "B" Scenario

The following diagram summarizes electrical demand growth in the Anchorage district according to Case "B" assumptions. Overall growth is forecast at 2.7% per annum compared to ISER's 3.98%.

Figure 4.7: Case "B" Summary

<u>Date</u>	<u>Space Heat</u>	<u>Major Appl.</u>	<u>Minor Appl.</u>	<u>C-I-G</u>	<u>Total</u>	<u>ISER Forecast Total</u>
1985	489	441	191	1190	2311	2438
1990	548	471	230	1267	2516	2782
1995	641	533	291	1558	3023	3564
2000	722	603	363	1798	3486	4451
2005	740	687	427	1967	3821	5226
2010	764	780	503	2152	4199	6141

<u>Average Annual Growth 1980 - 2010</u>	
ISER:	3.98%
Energy Probe	2.70%

5. MAJOR CONCLUSIONS AND RECOMMENDATIONS

Although we have outlined many recommendations throughout the text of this report, we believe some are sufficiently important to be restated and explained in greater detail.

5.1 General Commentary

Although the ISER model in its present form is not EEU as both ISER and Energy Probe has desired initially, it nonetheless represents an enormous advance in the quality of electricity demand forecasting in the State of Alaska. ISER is to be commended on the extent to which they have incorporated available data, on the manner in which they have laid out their assumptions, and on their willingness to attempt new procedures and techniques. We believe that, our suggestions notwithstanding, the ISER model represents an excellent vehicle through which to view the State's electricity future.

5.2 Funding for Load Forecasting Research

Although demand forecasting is considered to be the most important element of the planning process; it continues to receive a disproportionately small share of overall research funding. If demand forecasting is to provide a useful guide to energy policy development, and if energy projects are to be evaluated with the highest possible degree of confidence, additional funds must be made available so that data can be

collected and analyzed and the model structure improved.

5.3 ISER Model Automation

While the ISER MAP model is fully automated, the end use model at present consists of several hundred worksheets, changes to which must be made manually. In this form, the end use model is virtually inaccessible to analysts who might wish to test the effects of various end use assumptions: the development of a single alternative scenario for the entire Railbelt would take many days. This serves to limit the potential of the model as a policy analysis tool.

Ideally, the entire forecast model, that is, the MAP, household formation, housing, regional allocation and end use components, would be automated. We believe that such an effort should be made.

5.4 Future Use of the ISER Forecast

Because the ISER model represents such an advance over previous forecast methods, we believe that it should be utilized in the evaluation of future energy projects in the State. In other words, while specific assumptions can, of course, vary over time and among analysts, they should be incorporated, and the results viewed, within the context of the ISER forecast. Efforts should be made to improve the weak points of the forecast, the result of which would

be a forecast structure which forms an excellent basis for project evaluation and policy analysis.

5.5 Data Collection

Data collection methods within the State should be improved, in at least the following ways:

(a) the results of the 1980 Census should be incorporated into the forecast at the earliest opportunity;

(b) air photo interpretation should be employed to reconstruct the building stock for the Railbelt;

(c) information from the energy auditing programs should be used to gain a fuller understanding of the CIG and residential building stocks.

5.6 Statewide Electricity Demand Forecasting

Data should be collected, and the ISER model revised and expanded, so that the model can be used to forecast electricity requirements for the entire State of Alaska. This will require several structural revisions to the model, especially with respect to the regional allocation component.

5.7 Peak Demand Forecasting

A peak demand forecasting method should be developed to be applicable to all Stage I and Stage II scenarios. This analysis

should be conducted by estimating and summing the load characteristics of each individual end use. The potential for load management and the effects of time-of-day pricing should be considered in the research. However, at the present time, we do not believe that it would be worthwhile to develop an integrated energy/demand forecast.

5.8 Additional Stage I Scenario

At present, all three Stage I scenarios developed by ISER assume a steadily increasing level of State economic activity. However, the possibility of a significant slowdown in resource sector activity during the 1990's has been considered by a number of individuals, resulting from the depletion of the most accessible and least expensive natural gas and oil deposits. Given the real possibility and significant consequences of such a scenario, we believe that it would be worthwhile to model this possibility in the same fashion as ISER has modelled the three major scenarios to date.

5.9 Independent Expert Advice on the Load Forecast

It has been argued that an appropriate way to review and evaluate the ISER model results would be to draw together a group of individuals familiar with State economic and energy affairs. This group would evaluate the likelihood and feasibility of the model's assumptions, from which a fuller

appreciation of the range of possible electrical futures could be obtained.

We believe that such an exercise might prove fruitful for two reasons. Firstly, such a group might achieve a consensus with respect to probable electrical futures (or, failing consensus, might better understand the assumptions about which the group cannot agree). Secondly, the logic behind the ISER method could be spread over a wider range of parties, resulting in a deeper appreciation of the factors affecting electricity growth and the role of State policy in these areas.

We should qualify the above, however, by stating that policy intervention can assist in determining the "probability" of a particular electrical future; thus this approach should be seen not as a substitute for, but rather as a complement to, continued energy policy research in the State.

APPENDIX

WORKING PAPER #1: A PRELIMINARY EVALUATION OF THE ISER ELECTRICITY DEMAND FORECAST

January 2, 1980 (amended for inclusion)

Preface

In October 1979, Energy Probe was asked by The House Power Alternatives Study Committee (HPASC) of The Alaska State Legislature to submit a proposal for a study that would evaluate the electricity demand forecasting method developed by The University of Alaska's Institute of Social and Economic Research (ISER). This report presents an initial evaluation of the ISER forecasting model and the Man in the Arctic (MAP) model on which, in part, the electricity demand forecast is based.

The present report draws on information contained within the Detailed Work Plan submitted November 14, 1979, by Dr. Scott Goldsmith of ISER; May 1979 MAP model documentation; various publications relevant to the future social and economic activity in the State of Alaska; and personal discussions with ISER personnel.

A further report will deal with the sensitivity of electricity growth in the Railbelt region of Alaska to policy and market induced changes in the social, economic and physical factors which influence electricity growth; and with an analysis of the appropriate role of electricity demand forecasts within the broader context of State energy policy development.

Because this report is a working document intended only for use by HPASC members and consultants, it is written in relatively technical language. Our final report will detail the three areas mentioned above in less technical terms.

The views expressed herein are those of the authors, and not necessarily The House Power Alternatives Study Committee.

1. Introduction

Electricity demand forecasting, like all quantitative forecasting, is an effort to view the past and present in a systematic way with a view towards making reasonable statements about the future. The basic problem is that the future is not known, and indeed cannot be known, even in a probabilistic sense. As a matter of fact, pretending to forecast the future is an indictable offence under the New York State Criminal Code (1). Similar provisions, we are certain, are in effect elsewhere.

However, analysts often find it necessary to fly in the face of strict legality when the viability of a large project hinges on

the need for it in the future. Hence, forecasting has become an integral part of planning for investments in energy, transportation, housing, and a myriad of other functional service delivery areas. Forecasting the demand for such services comprises a two stage process. In the first stage, aggregate social and economic activity is projected into the future (using, for example, the ISER MAP model); the second stage translates this aggregate activity into a detailed forecast of the demand for the product or service in question.

Stage I models tend to be rather ubiquitous, finding application in a number of functional areas. MAP, for example, has been used in a variety of forecasting environments including energy impact analysis and fiscal forecasting. On the other hand, Stage II models are generally specialized and tailored to the problem at hand. In transportation planning, they are classified under the general heading of travel demand models. In energy demand forecasting, a number of different approaches have been developed, which have met with varying degrees of success. To the extent that a debate over appropriate forecasting methods exists, it is really a debate over the choice of a Stage II approach. In fact as we argue below, the choice of a Stage II approach essentially dictates the output and hence the structure of the Stage I model to be used.

The argument over Stage II models centers on the extent to which the model should deal with two distinct but equally important aspects of the problem. Given an aggregate forecast from Stage I, should a Stage II model focus on the specific activity involved or should it focus on the decision of the consuming unit? In forecasting within a policy environment concerned with housing, for example, the latter dictates that we examine household budgets, prices and so on. However, a dwelling offers service far beyond simple shelter; amenity, proximity and opportunities for social interaction are but a few of these. Hence, the former approach would argue that the demand for housing is really a composite demand for the services offered by a structure. Energy and transportation are similar. Rarely are they required for their own sake: in reality they are crucial inputs into a number of satisfaction-yielding activities.

In electricity demand forecasting it was once possible to do a reasonable job of prediction by looking at a historical growth rate and simply plotting future levels of consumption against time. A draftsman with a French curve (or an engineer with semi-log paper) could make a reasonable guess at future demand by simple curve fitting and extrapolation. However, it is logically clear that the growth in electricity demand has little to do with the passage of time per se. Rather, it is related to individual decisions to engage in a growing number of electricity-using activities over time.

2. Stage II Modelling Approaches

Attempts to deal seriously with this complexity became necessary in the early years of the 1970's when historical rates of elec-

tricity growth ceased to be realized by most electrical utilities in North America. The formation of OPEC and the 1973 Arab oil embargo, with its subsequent increases in petroleum prices, ended the era of cheap energy; and all fuels, including electricity, rose in price rather dramatically. Unfortunately, the econometric demand forecasting models in use at this time (2) were incapable of dealing with such rapid changes and continued to point to historic or near-historic rates of electricity growth. ISER's 1975 electricity demand forecast for the State of Alaska (with which, we might add, ISER itself was not comfortable) is a case in point. The most telling criticism of its strict time-series econometric approach is that potentially ludicrous activity forecasts result. In ISER's 1975 effort, for example, initial results indicated a demand for electricity which implied 100% saturation of electric space heating in Fairbanks in the future. The point to be made here is that because individual activity levels are not explicitly identified in aggregate economic models, such models run the risk of implying physically unrealistic activity levels.

End use forecasting models in their pure form take the opposite approach by relying almost exclusively on activities, independent of the underlying economic conditions. The logic is simple: consuming units engage in various activities requiring energy. Energy growth can result from

- (a) engaging in additional energy consuming activities;
- (b) engaging in the same activities more intensively;
- (c) engaging in the same activities less efficiently;
- (d) any combination of the above.

The case of oral hygiene provides a humorous example. A household may switch from "manual" to electric toothbrushing, an additional energy using activity. Given an electric toothbrush, members of the household may wish to brush more regularly. When the toothbrush wears out it may be replaced with a model which delivers fewer brush strokes per unit of energy input. In any of these cases, electricity use increases. In principle, it is possible to examine all electricity use in this manner, noting that all energy is used in a final form such as heat, light, motion or sound, and that it is transformed from its input form to its final end use form by a "device".

Again, in principle, electricity demand can be projected by forecasting the characteristics of devices and activities. This has become known as the engineering or end use approach to demand forecasting. The most telling criticism of this method in its pure form is that it is not sensitive to changes in prices, incomes and preferences, i.e. the decision aspect of the process modelled in Stage II. This is a generally accurate criticism whose resolution requires an examination of policies affecting the decisions of the individual consuming unit. In further work for HPASC, we will be discussing this problem.

For functional forecasting purposes, an approach is emerging which seeks to overcome the inherent difficulties of both extremes of Stage II modelling methods. The econometric-end use approach (EEU) attempts to deal with electricity use at the level of the activity while recognizing that the decision to own and operate a device, i.e. to engage in an activity at some level of intensity, is inherently a problem of microeconomic choice and is therefore sensitive to prices, incomes and the availability of alternatives (3).

In our opinion, an EEU approach is the only sensible way to forecast electricity demand and to justify a huge expenditure of public funds.

We are pleased that ISER agrees in principle with this general philosophy. The detailed work schedule circulated by ISER lays out a rather impressive work plan. We anticipate problems arising because of the extensive data requirements of EEU, which will be intensified by the basic data problems of Alaska: short time series and small population. However, we fully support ISER's desire to cast the net widely at first, while recognizing that data, and more importantly time and financial constraints will require the net to be drawn in somewhat.

At this point we would like to comment on the allocation of resources for independent demand forecasting relative to the magnitude of potential capital investments. Given the magnitude of the stakes for a project such as Susitna, i.e. a potential investment of billions of dollars, we feel that far too little money is being spent on this crucial element of project feasibility. ISER will likely argue, and justifiably so, that data is simply not available to construct a full scale EEU model. The missing data, however, is not of the variety which is impossible to collect. With additional resources made available, it could be gathered and incorporated into the forecast model, resulting in a forecast method with which all could be reasonably comfortable.

In the following pages we will review the EEU approach to Stage II and the requirements of a Stage I model to provide requisite inputs into EEU. Our goal is twofold: first to analyze and suggest approaches to particular problems for the benefit of ISER, and secondly to lay out the logic of ISER's forecasting proposal for the benefit of all consultants involved in HPASC studies. It is our hope that this will facilitate discussion and understanding of ISER's methods and in the longer term, identify avenues for potential policy intervention.

3. The Econometric-End Use Approach

EEU begins with the simple proposition that all energy is used in capital items or devices, which perform a specific task, i.e. an end use. Each device, by virtue of its design, has a specific energy input requirement for each unit of useful output, a concept similar to "First Law Efficiency". Devices are owned or rented and operated by consuming units. However, not all consuming units own all types of devices, nor do devices operate at all times.

Further, many devices may be powered by more than one fuel. The decisions to own or lease and operate a device are economic decisions made by the consuming unit in light of prices, incomes, preferences and available options. For a given period, say a year, the total energy required by a consuming unit to power a given device is by definition its hours of operation times its power requirement. If the device is electrically powered, this energy demand will contribute to an electricity demand estimate. Any portion of the electric power consumed by the economic unit which it generates itself, does not contribute to this utility forecast.

There are, of course, many consuming units and many devices. We may translate from the device level at the consuming unit by simply summing over devices and consuming units yielding the following expression for utility electric demand over a period of one year:

$$TUD = \sum_{k=1}^N \sum_{j=1}^M (D_{kj} \times E_{kj} \times I_{kj} \times R_{kj} - S_k) \quad (1)$$

where

- TUD = total utility demand (kW.h)
- D_{kj} = 1 (if consuming unit k has device j)
0 (if otherwise)
- E_{kj} = 1 (if device j is powered by electricity in consuming unit k)
0 (if otherwise)
- I_{kj} = intensity of use of device j by consuming unit k (hours)
- R_{kj} = power requirement of device j by consuming unit k (kW)
- S_k = amount of self supplied electricity by consuming unit k (kW.h)
- N = total number of consuming units
- M = number of distinct devices

This is an accounting framework for utility demand (4). To operationalize it for forecasting purposes, each of the components must be related to known of "knowable" variables. Engineering knowledge and economic theory suggest potential relationships. Econometric or other techniques are used to estimate their direction and strength.

For operational purposes it is necessary to group consuming units into classes on the basis of predominant activity within the unit (i.e. residential, commercial, etc.), similarity in patterns of device ownership or energy requirements, or some other appropriate criterion. Clearly, there are losses in precision due to this sort of aggregation. After grouping consuming units into classes, the demand for utility electricity is obtained by the following expression:

$$TUD = \sum_{i=1}^Q CUD_i = \sum_{i=1}^Q \sum_{j=1}^M (N_i \times PD_{ij} \times PE_{ij} \times I_{ij} \times R_{ij} - S_i) \quad (2)$$

where

- CUD_i = the demand for electricity by class i (kWh)
- N_i = the number of consuming units in class i
- PD_{ij} = the proportion of class i consumers owning device j
- PE_{ij} = the proportion of device j in class i that are electrically powered
- I_{ij} = the average intensity of use of device j by members of class i (hours)
- R_{ij} = the average power requirement of device j owned by members of class i (kW)
- S_i = the amount of electricity self supplied by class i members (kWh)
- Q = the number of consuming classes

The advantage of examining end use demand in this manner is obvious. Not only is it less data intensive than Equation (1), but also, key parameters become easier to pinpoint. For example, in an analysis of a subclass comprised of mobile homes built before 1970, space heating requirements would be rather similar.

Time, of course, is also a crucial consideration which must enter the model in a forecasting environment. The advantage of an end use model is that the factors developed above exhaust the realm of demand factors, and each will change over time. As time passes, classes of consuming units grow or decline, devices become more or less prevalent and more or less "electrical", self-supplied electricity may become more widely used, devices may be used more or less intensively, and device efficiencies will undoubtedly change. The latter is particularly important since many devices will be replaced over the forecast period and those which are not may be "retrofitted" to improve their performance.

While the passage of time is itself not the reason for change, the argument above suggests that it may prove fruitful to view demand growth in a temporal sense. At a point in time we begin with a "stock" of consuming units equipped with devices. Over the ensuing year the consuming unit may disappear, change or modify its collection of devices or means of powering them. In addition, new consuming units may be formed complete with new devices. Presumably these new devices would have energy consumption characteristics different from "old" devices. At the end of the year we witness a revised stock of existing consuming units and devices comprised of the previous year's units plus net increases. This may be taken a year at a time over the entire forecast period yielding electricity requirements for specific annual points and annual increments in demand.

4. The ISER Model and Suggested Approaches and Revisions

In the context of the Railbelt region, EEU makes a great deal of

sense for the residential and commercial sectors which, taken together, account for about 86% of Alaska's total electricity demand. Because industrial development in Alaska is largely of the major project variety, it is best to examine these in a case by case manner. Further, with the exception of block heating in vehicles, the transportation sector currently uses an insignificant amount of electricity. Again, this is best viewed as a special case.

ISER's EEU model, Figure 1 in their "Detailed Work Plan", incorporates most of the features of an ideal EEU discussed above. It is a stock/flow model which segregates consuming units into "new" and "old" and deals with four residential subclasses, and segregates devices into six categories including an "other" category for minor appliances.

The commercial sector should be divided into at least the following groups:

- (a) public/institutional buildings;
- (b) large shopping plazas/office buildings (say larger than 100,000 or 250,000 square feet);
- (c) other commercial buildings.

This would be fruitful for two reasons: within each group there are similar requirements for electricity; and policies/programs may be specifically tailored, at a later date, to this particular pattern of consumption and occupancy/ownership.

Missing in ISER's proposed model is a term to account for electricity or energy supplied by the consuming unit and hence not required from a central system. This should be added to the model even though it may not greatly affect the magnitude of the final forecast. A number of considerations warrant its inclusion, not the least of which is the possibility of co-generation of electricity and steam for space heating in large commercial establishments, schools, hospitals and the like.

The present ISER formulation allows for the scrapping of dwelling units but not for the replacement of appliances within existing units. A number of appliances ISER intends to consider have useful lives of substantially fewer years than either the forecast period or the structure. In ISER's model, this problem could be solved by adjusting the average consumption of appliances on an annual basis. It is better, however, not to confound the efficiency measure with the effect of new appliance stocks.

Given these structural refinements which we consider necessary, the ISER approach to residential and commercial electricity demand forecasting is methodologically sound. Since residential and commercial consumption in the Railbelt is quite important, it is necessary to examine the components of the EEU model and to suggest possible approaches to modelling each component. In this case we refer initially to our formulation of EEU above, and explicitly to these elements pertaining to Stage II.

In Equation (2), total utility demand was expressed as the sum of class demands. Class demand is a function of the number of

units in the class, the proportion owning various devices, the proportion of these devices powered by electricity, the average intensity of each device's use, the average power requirements of the various devices and the amount of self supplied electricity. The number of consuming units in each class is essentially a modified form of the output of State I which we discuss below. The remaining factors are, however, Stage II concerns which we deal with in turn.

PD_{ij} , the proportion of class i units owning device j , is obviously a variable whose value lies between 0 and 1. For certain end uses, i.e. space heating, its value equals unity and will continue to do so over the forecast period. In other cases like clothes drying and refrigeration, its value is a matter of choice, and while perhaps initially close to unity, it is variable over the forecast period. In an ideal world we would hope to estimate this proportion on the basis of income level and distribution within the Railbelt region, bearing in mind that the decision to own a device also commits the owner to operating expenses over its lifetime. Hence the general price level of all competing fuels may be important.

PE_{ij} , the proportion of device j owned by class i which are electrically powered is also a variable whose value ranges from 0 to 1. Again, for certain end uses, especially refrigeration, its value is close to unity and will likely remain so over the forecast period. However, a great deal of choice exists in this area. A useful way to look at this problem has been proposed by Fuss who suggests the decision to engage in an activity with a specific fuel is essentially separable. In other words, given a decision to engage in an activity, the choice of fuel is essentially a separate question (5) made on the basis of relative prices.

The question of the treatment of conservation arises in this instance. If conservation is factored into average energy requirements, then no more need be said. However, if we view each or any device as having a "base-line" energy requirement, then any effort to reduce it involves an explicit tradeoff of electricity for conservation. In this sense, conservation is self-supply, and has an average supply price equal to the amortized annual cost of the conservation project divided by the number of kilowatt-hours displaced during a year. Marginal costs may be calculated by assuming, ideally, various levels of conservation and calculating, presumably, a step function for the fuel equivalent value of various conservation schemes. The same logic may be applied to renewable energy projects as well.

We feel it is useful to view conservation and renewables in this way when considering existing activities at a point in time. The major point is that given an existing activity, like space and water heating (the major ones) the consuming unit can choose not only to switch from one conventional fuel to another but can also choose to supply a portion of its requirements with conservation. In an oil heated home, for example, the household may switch to gas, electricity, or conservation for all or part of its heating

on the basis of relative prices. Considering conservation as an explicit fuel represents a useful modification of interfuel substitution analysis.

R_{ij} , the average power requirement of device j in class i , becomes basically an engineering design parameter when conservation is treated as a fuel. Consequently, it is a function mainly of vintage, not confounded by retrofit. One item that should be examined is the trend in device efficiencies over time. This may well be an appropriate area for regulation.

I_{ij} , the average intensity of use of device j by class i members is also a consumer choice variable although to a limited extent in the major consumption categories. Actions like reducing inside temperatures and the like are evidence of the economizing behaviour of households under this category; how much further we can go in this area is certainly questionable. In this case, comfort and convenience bound choice from below. To the extent that there is flexibility it is likely price and income related.

The final term in our formulation is S_i , the amount of self-supplied electricity by members of class i . In this instance we suggest that this term be kept pure in the sense that conservation not be viewed as self supply in this term. We include S_i in the model for the reasons stated above. There is a price at which self generation or co-generation becomes attractive whether by means of water power, wind or conventional fuel. The model should be sensitive to this possibility.

The above relates to our formulation and also to ISER's model. The remaining terms in ISER's model relate to new household formation which we discuss below and the various "scrapping rates". Scrapping of a device involves not only physical deterioration but also economic considerations, one of which is the device's fuel requirements. Logically, the scrapping rate should increase with decreasing energy requirements for new models of a particular device. This is extraordinarily difficult to measure and project over time; however, it is something to be kept in mind.

Generally speaking, we are impressed with ISER's proposed method for handling the Stage II modelling of the residential and commercial sectors. With the modifications suggested above we can wholeheartedly endorse ISER's approach and we look forward to working with ISER on further questions of approach and sensitivity analysis. With respect to the ISER approach to non-residential and commercial use of electricity, we reserve judgement since the method has not yet been developed. We will, of course, comment at an appropriate time and we are confident that ISER will take a sound approach, based on their work to date.

5. Stage I Approaches

We now turn to the merits of the MAP model of the Alaskan economy as a Stage I model for EEU forecasting. Regional economic forecasting can take a number of forms. Some approaches being

considered in the "Detailed Work Plan" are input-output analysis, the economic base approach, Curtis Harris' locationally efficient model, and the Delphi technique. These all have strong and weak points but none is a serious contender to a moderately detailed econometric model like MAP.

What is required of the Stage I model? It must provide the number of consuming units in each class for the end use equation. That is, in the number of housing units of several types and the number of firms, employees, square footage or business volume for commercial and institutional units. It must be sensitive to the scenarios of fast, likely and slow growth mentioned in the "Detailed Work Plan". It must respond to changes in oil and gas pricing, energy and other major investment projects, national economic trends, and demographic realities including migration. While the current MAP model incorporates most of the latter functions, the restriction of demographic projections to persons (not households or families), the introduction of housing only through the dollar volume of construction, and the lack of other physical measures of economic activity closely related to the number and type of consuming units are major deficiencies. As noted in the "Detailed Work Plan", data must be gathered and incorporated into new versions of MAP.

What regional techniques must be added? In our opinion, none of the above mentioned techniques merit much effort.

Input-output analysis is appropriate when a region has a large industrial base which relies to a great extent on inter-industry sales. Alaska does not have such an economy yet, and the method's well known data intensity suggests that it need not be considered further. Shortcuts to true regional input-output data gathering - such as the use of technical coefficients borrowed from other studies - are inappropriate for an unusual state economy such as that of Alaska.

The strong points of economic base analysis - a technique which is useful when the regional economy pivots on clearly defined basic industries - are already contained within the MAP model. The simple economic base methods are too elementary; ISER is well beyond them already in its work. The same criticism holds for purely extrapolative methods. Just as ruler and graph paper are inappropriate for load forecasting, they are too simplistic for the economic part of econometric-end use analysis.

Curtis C. Harris developed a regional forecasting model at the detailed industry level based on short time series changes in output by industry and state and incorporating transportation costs estimated by optimization techniques. Alaska clearly is not likely to exhibit consistent locational cost patterns of industrial development necessary to take Harris' approach.

Delphi, a technological and political forecasting technique developed first at the Rand Corporation is unlikely to yield the moderately detailed consuming unit forecasts needed here. However, it may always be considered for developing scenarios for energy projects, general economic growth levels, or energy policy

decisions. Hence it is not a Stage I model but a source of exogenous and policy variable values for any forecasting method.

Among general methods for forecasting regional economic activity, one not yet mentioned is shift-share analysis. This method is based on statistical estimation of the contribution to a state's industrial growth of industry factors and regional factors. It is an excellent basic method which is sufficiently incorporated in a MAP-style econometric approach. While both input-output and shift-share methods are usually performed with a great deal of industry detail, such detail is not needed in our Stage I approach.

What is needed is more detail aimed at household characteristics and building stock characteristics. While data source end points for households are well known and trusted, a region such as Alaska can have rapid and crucial post-Censal fluctuations in households and household size. As for buildings, only dwelling units are enumerated in the Census. Building stock estimates for non-residential units are rare above the city level (6). Land use surveys and Civil Defense surveys give spotty data sets, but the building stock is basically an unknown quantity for regions such as states. For the current research, increased information on the building stock is important.

As an expedient it is suggested that housing be looked at in detail (so as to allow better end use forecasts for space and water heating, lighting and appliance loads); that large commercial and institutional uses be examined through enumeration of structures; and that the rest be treated by the use of employment or sales estimates.

Recent efforts by others in energy forecasting suggests two approaches:

- (a) macroeconomic econometric models such as MAP;
- (b) microeconomic simulations of consuming unit responses to changes in price, income and the availability of alternatives.

The former is necessary to introduce national and major regional trends. The latter is used to discover what the distributional effects of new pricing and supply levels will be.

A study commissioned by a number of New York consumer groups and carried out at Cornell University was used in testimony before the New York State Energy Master Plan Meetings in September 1979 (7). In this approach, Green, Mount and Saltzman utilized a four-sector economic/demographic state econometric model with a partially integrated energy sub-model. The four sectors were residential, industrial, commercial and transportation. All major energy types - electricity, oil, gas and coal - were forecasted simultaneously. This Cornell model as well as another model developed with end use detail by The New York State Energy Office, predicted significantly lower electricity requirements than has previous state plans. It should be noted that while the Cornell model is not extremely complicated (57 economic equations, 150 demographic equations) it contains household formation functions for each age-sex cohort. Unfortunately, the Cornell model does not give explicit place in its structure to self-supply wood space heating or conservation.

Furthermore, in the Cornell approach, a microeconomic simulation was linked to the macro model in order to relate income and price changes and restrictions on fuel supply to consumer demand for the different fuels (8). This, of course, requires an extensive data base of individual households studied by survey research methods. In this case a sample of 7000 households was utilized.

While such microsimulation may be beyond current possibilities in evaluating Susitna (and we are not convinced that such further study should be considered extravagant) it suggests again the need to make the energy forecasting version of MAP more oriented to consuming units, households, and the biggest devices of all, buildings.

Looking in more detail at MAP, based on the may 31 1979 documentation, we note that it has more than enough economic detail, but not enough demographic information because of households not appearing explicitly. Finally, a housing and/or buildings component is lacking; this is a critical shortcoming.

In the "Detailed Work Plan", we support most strongly Items A7 - 9 on electricity consumption; Item 10 on households, houses and appliances. These are more important, in our estimation, than the refinement of the MAP economic model per se. They should receive top priority.

Regional disaggregation (Task B) is important, but less so than getting on to EEU forecasting for the Railbelt region as a whole. Thus the items in "D" are crucial - interfuel substitution plus the addition of conservation.

A general evaluation of the MAP models serves to reveal several strengths in addition to the above shortcomings. First despite the limited length of the Alaska data series, the resulting equations are adequate by conventional statistical benchmarks, at least for forecasting use. The detailed fiscal and native/non-native/military results, needed for earlier applications, are well developed, but may not be particularly helpful in the current application.

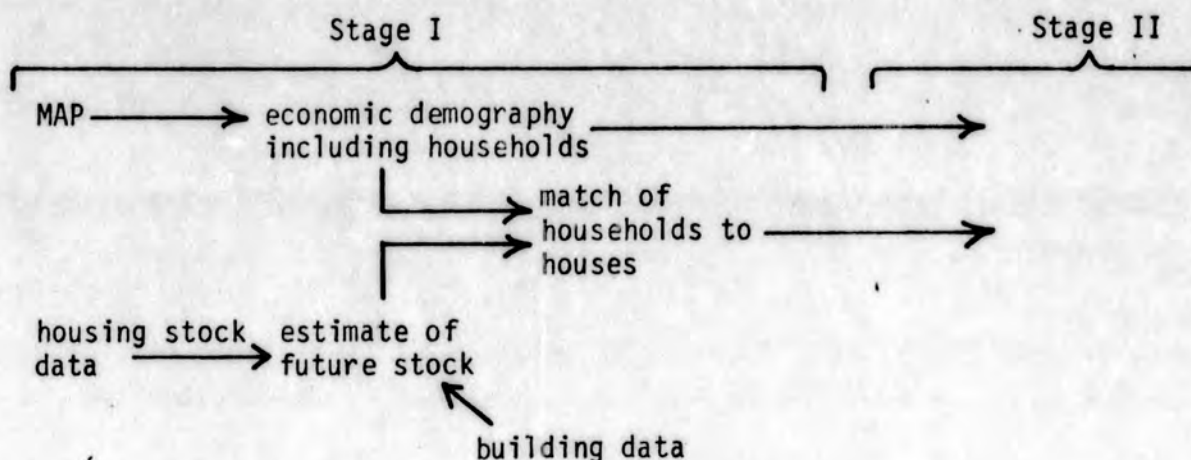
What is needed, more than any other modification, is a housing sub-model. Whether the data can be gathered for such an addition remains to be seen. Lacking a formal housing model, some intermediate step is required based on the housing stock data from the decennial censuses. A brief outline of each alternative is in order.

A full-blown econometric sub model for housing would flow from the following modifications to MAP:

- (a) inclusion of household formation equations in the demographic sub-model;
- (b) a set of equations for the housing stock (or alternatively changes to that stock) by age and type of unit.

Some of the crucial right hand variables would be from the construction and investment functions of the economic model as well as the household formation results.

If the time series data are lacking for the housing modifications to MAP, then the available census benchmarks - number of dwelling units by age and type - should be combined with recent data on housing starts, mobile home sales, building permits, etc., to update the distribution of the housing stock. This results in the following structure:



6. Conclusions

Energy demand forecasting, the most crucial element of energy policy development, is difficult in the face of growing uncertainties. In order to maintain confidence in forecasting procedures, the analyst is faced with the need to develop what amount to relatively more sophisticated models and forecasts than has traditionally been the case.

Pure econometric and pure end use forecasts suffer inadequacies; hence, a blended approach combining the best elements of each is necessary. This blended EEU approach is difficult because of its data requirements and because modifications must be made to the structure of the underlying econometric and end use models on which it is based.

In the long run, an EEU forecasting system for Alaska can be developed with MAP, suitably modified, at its heart. Its data requirements are not yet attainable in a small region such as Alaska with a short data history. Therefore, in the short term, ad hoc forecasting must be carried out with the outputs of the current version of MAP. These outputs must be obtained by using a very wide range of input scenarios.

The most crucial shortcoming of the current version of MAP is the lack of a housing sector and this must be bridged by some reasonable, if imperfect method of estimating Alaskan housing stock and characteristics in recent years.

7. Footnotes

1. Joan Robinson, "What are the Questions?", Journal of Economic Literature 15, December 1977, p. 1322.
2. These are extremely expensive and sophisticated versions of semi-log paper. See Herman Daly, "Energy Demand Forecasting: Prediction or Planning?", Journal of The American Institute of Planners, January 1976.
3. Robert W. Shaw Jr., "New Factors in Utility Load Forecasting", Public Utilities Fortnightly, July 19, 1979, pp. 19 - 23.
4. Much as Dr. Goldsmith's is a stock/flow approach to accounting for demand.
5. M. A. Fuss, "The Demand for Energy in Canadian Manufacturing: An Example of the Estimation of Production Structures with Many Inputs", Journal of Econometrics 5, January 1977, pp. 89 - 116.
6. B. Jones, D. Manson, J. Mulford, M. Chain, The Estimation of Building Stocks and their Characteristics in Urban Areas, Program in Urban and Regional Studies, Cornell University, 1976.
7. W. Greene, T. Mount, and S. Saltzman, "Forecast of the Demand for Major Fuels in New York State 1980 - 1994", Technical Report, September 4, 1979.
8. S. Caldwell, W. Greene, T. Mount and S. Saltzman, "Forecasting Regional Energy Demand with Linked Macro/Micro Models", Working Paper in Planning #1, Department of City and Regional Planning, Cornell University, January 1979, forthcoming in Papers of the Regional Science Association 45.

A PRELIMINARY EVALUATION
OF
THE I.S.E.R. ELECTRICITY DEMAND FORECAST

(Working Paper #1)

Robert E. Crow
Dr. James H. Mars
Christopher J. Conway

Energy Probe,
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Toronto, Canada, M5S 2C3.
(416) 978-7014

DRAFT

ENERGY CONSERVATION POTENTIAL FOR ALASKA'S RAILBELT

Prepared for
Alaska Center for Policy Studies

Note: This report was sponsored by Power Alternatives Study Committee of the Alaska House of Representatives. The Committee is charged with assessing alternative strategies for meeting demand for power in the Alaska Railbelt.

March 1980
By Mark Baumgartner and
Samuel Skaggs
Produced by the Alaska
Federation for Community
Self-Reliance, Inc.



ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

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

MEMORANDUM

May 26, 1980

TO: Representative Hugh Malone
Representative Brian Rogers
sub JR

FROM: Susan Brody and Jack Fagnoli

RE: Fiscal Note--Legislative Oversight of Susitna Hydroelectric
Project Feasibility Study (Acres American, Inc.)
(Research Request No. 144)

The cost of providing legislative oversight of tasks 1 and 11 of the Susitna Hydroelectric Project feasibility study has been estimated at \$135,000, and is depicted on two copies of a fiscal note, attached. This estimate represents the cost of monitoring portions of the Acres American, Inc. study through May of 1981, including the power studies (Task 1), and the study's initial financing feasibility phase (Task 11).

The assumptions upon which the estimated cost is based are as follows:

- . Oversight monitoring will be coordinated by the House Research Agency (no additional funding required), including ongoing monitoring of the contractual activities described below.
- . A single contractor or several contractors, as necessary, will be engaged by the House Research Agency to assess the progress of the feasibility study at identified benchmark stages (coinciding with completion of specified subtasks). Contractor reports to the Agency, and through it to the Legislature, will assess progress to date, identify any potential problem areas, and discuss the implications of the subtask findings for ensuing stages of the feasibility study.
- . Contractor costs will be approximately \$500 per day, based on current billing rates estimated at \$50-\$75 per hour.

Representative Hugh Malone
Representative Brian Rogers
May 26, 1980
Page 2

Based on these assumptions, and the time period for the study, oversight of the subtasks has been costed out as follows:

<u>Subtask</u>	<u>Activity Involved</u>	<u>Estimated Time</u> <u>(@ \$500 per day)</u>
1.01	ISER Power Demand Report	30 days (full-time equiv.)
1.02	Peak Load Forecasting	20
1.03	Power Alternatives	40
1.04	Viable Expansion Sequences	20
1.05	Expansion Sequence Impact Assessment	20
1.06	Power Alternatives Study Report	<u>10</u>
10. - FERC		Subtotal: 140 days (\$70,000)
11.03	Alternative Power Sources/ Risk Analysis	40
11.04	Base Plan/Initial Risk Analysis	40
11.07	Tax Exempt Bond Issuance	30 ^a
11.08	Parties in Interest	20
11.10	Liason/Bond Underwriters	<u>-0-</u> ^b
		Subtotal: 130 days (\$65,000)
TOTAL:		270 days (\$135,000)

^a Estimate is high due to possible need for specialized bond counsel, at higher hourly/daily rate.

^b As this subtask is a continuous study activity and results in no monitorable product, costs for its oversight have been subsumed under Subtask II.07.

If we may be of further assistance, or if you would like any additional explanation of these estimates, please don't hesitate to contact us.

SB:JF/dp

Time to do something on the Susitna Dam

By BOB PENNY

What would you think about having "free" electricity for the rest of your life? Only one-third of the state's surplus income in 1981 would build and pay for the Watana Dam on the Susitna River. This one dam would provide all the electrical energy presently used by 75 percent of our state's population — and do it for the next 100-plus years.

What about an inflation-free investment of state funds? Capital investment by our state, such as roads, buildings, etc. become a liability to the annual budget as their yearly maintenance expense is 6 to 12 percent of the project's original cost. The Susitna project could earn money while providing us all with clean, non-polluting electrical energy.

What better use could we make of our surplus dollars than to provide long-term energy for ourselves? The legislature should consider creating a "Permanent Power Fund" that would provide capital to develop long-term, energy-producing sources of electricity around the state. Income from these energy sources could then be returned to the fund as a payment for the use of that energy by each one of us. What better heritage could we leave for future generations of Alaskans?

The dam feasibility study by the Acres American company won't be complete until April 1, 1982. But in the meantime, as part of its research, why doesn't the legislature appoint a committee to explore:

- What is involved in acquiring title to the sites?
- How best to fund the project — over 10 years?
- What federal and state permits will be needed?
- What impediments are there?

When and if the final decision is made to build the project, all of this preliminary relatively inexpensive research could be done, saving us 18 months of valuable time.



compass

**points of view
from our
community**



The continual quoting in the media of misleading statements by environmental sources of late dictates some answers.

For example:

"We should have more studies because Wataana and Devil's Canyon will be harmful to the fisheries and their habitat." Unmentioned is the fact that no anadromous fish or salmon spawn upstream above the Devil's Canyon site. The river there is almost sterile. The reservoirs would help provide more fish habitat.

Much has been said about the fact that "we should have smaller hydroelectric projects and not a big one like the Susitna Dams," as if smaller is better. Statistics prove that the kilowatt cost for small hydroelectric projects is almost without exception higher than the cost of a single, large efficient source.

The comment that "Devil's Canyon, one of the two massive dams that will be built, is known worldwide as the ultimate white water challenge," is certainly true — only three or four people have ever navigated the river downstream and lived — none have upstream. The river in this portion is classified as non-navigable and has been for 100 years. What a tremendous recreational facility it will be when the reservoirs are complete; they will be a attraction for our state.

The biggest argument we hear against the Susitna Project is that it will produce too much electricity. The statement that "Susitna Dams,

when built, will provide enough electricity for the population of 2 million people" is not only misleading, it is a fabrication.

One of the dams will equal the energy requirements of what is needed today by the communities of Fairbanks, Healy, Anchorage, the Mat-Su Valley, Seward, Soldotna, Kenai, and Homer.

It is a safe bet that the energy produced by the second dam, when completed 12 years from now, will be needed then by the population of the area. This clean energy would allow Fairbanks citizens to heat their homes with electricity; make electric automobiles feasible; and do a lot to eliminate their ice fog.

Try to tell the people in Fairbanks, who are relying on coal and oil-fired energy sources, that there will be "too much electricity," while they pay 2½ times as much for residential electricity as do the people within the Anchorage area.

While utilization of wind, solar, and other forms of energy is important, the governor's new \$1.2 million "Alternative Energy Study" can only sum up with one conclusion: The basic energy needs for these communities over the long term will be provided by hydroelectric, coal generation, or nuclear power. Period. Take your pick.

The cost for the Susitna is quoted as: Watana Dam, \$1.46 billion; Devil's Canyon Dam, \$823 million; transmission grid, \$306 million; total, \$2.588 billion.

Each dam would produce 750 megawatts of power per year. Even though the reservoirs would help clear up the Big Su below the dams, the recreational lake behind the Watana would only lose 6 percent of its reservoir to sedimentation in the first 100 years.

Generating electricity by burning natural gas provides Anchorage with 85 percent of its energy; but this method of generating electricity is only a 30 percent effective use of gas. Electrical generation fueled by natural gas in our area is already burning 1½ times the amount of energy that would be provided if both Susitna Dams are constructed. Once the gas is burned, it is gone — and those reserves are being depleted.

Probably the single largest deterrent to early construction of the Susitna Dams is the price of electricity within the Anchorage area. Its cost isn't high enough yet to get our attention — but it is going to be.

The 23 percent increase recently asked for by Municipal Light and Power is only the first step. The fixed price in the city's contract lapses in January of 1986. It is very probably that the cost for gas-fired electricity in our communities will double, triple, quadruple, or go even higher than what it is today. Even Arlon Tussing, in a report for the state legislature, stated, "...prices for new gas supplied, whether from Cook Inlet or the North Slope, will be at least 10 times as costly as the utilities current supplies."

Just remember, if we start today with a sincere effort to construct Watana Dam, it will be eight years before it is generating electricity. Each year delay will cost consumers in Anchorage millions and millions of dollars more per year for electricity.

How fortunate we are to have the best probably site in our nation for a hydroelectric project. How incredibly fortunate we are to have the surplus funds necessary to build and pay for it. How unfortunate we are that it is not being built.

Bob Penney is the co-chairman of Susitna Power, Now! and president of the Anchorage Chamber of Commerce.

ALASKA RENEWABLE ENERGY ASSOCIATES

ENERGY CONSERVATION, SOLAR AND WIND CONSULTING SERVICES

July 29, 1980

Office of the Governor
Pouch A
Juneau, AK 99811

Re: Alaska Railbelt Power Alternatives Study

Dear Governor:

I have been following the various electric power supply and demand studies (Goldsmith/Huskey, Tussing, etc.) and feel compelled to express my interest particularly as it relates to the Kenai Peninsula. As a result of my building, economic, and energy related work I have become fairly familiar with the energy supply and demand picture on the peninsula and I feel that up to this point no one has appropriately dealt with this significant part of the railbelt.

The Kenai Peninsula represents an area as much different from Anchorage as Fairbanks. For example:

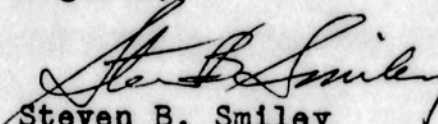
- * Prices vary significantly for energy compared to Anchorage and are recently changing for electricity, bringing about a per capita shift away from electric use.
- * Historical use on the Kenai Peninsula is of little value for projecting future growth.
- * Significant potential for waste heat utilization and cogeneration exists for existing and new industry.
- * Energy conservation and solar potential are high in this region due to population characteristics, a different economic base, higher energy prices as well as recent legislation.

The Peninsula contains about ten percent of the railbelt population and perhaps a much greater percentage of energy demand. Any energy study of the railbelt should have Kenai Peninsula specific data included to ensure consideration of the best options for railbelt energy needs.

(page 1 of 2)

I would like to express my interest and willingness to become involved in the studies when your office begins to look seriously at the power alternatives for the railbelt.

Regards,



Steven B. Smiley
S.R.A. Box 41-C
Homer, AK 99603

(907) 235-7349

cc Rep. Hugh Malone
Rep. Brian Rogers



THE NORTHERN LINE

VOLUME II ISSUE III

MAY 1980

*"Behind is a forest that goes to the Arctic ...
And here we must draw our line."*

-Gary Snyder

The APA and Our Energy Future

The Great Alaska Power Grab

The Susitna River rises in the glaciated peaks of the Alaska Range and flows south some 275 miles into Cook Inlet, near Anchorage. The upper Susitna basin is home to the most heavily-hunted caribou herd in Alaska and has historically contributed 20% to 25% of the moose harvest in the state. The "Big Su" sustains major commercial and sport fisheries. And Devil's Canyon, where one of the two massive dams may be built, is known world-wide as the ultimate whitewater challenge. Even by Alaskan standards, the Susitna is truly a unique wild river.

But the proposed Susitna hydro-electric project would affect much more than just the river and its resources. It raises some very basic questions: What sort of energy future do Alaskans want? And who will control that future?

The \$4.2 to \$6 billion Susitna project could lock Alaskans into patterns of power development and consumption which make us more and more dependent on large-scale, centralized production, controlled by big government and bureaucracy.

Boosters of the Susitna project claim energy consumption in the "railbelt" area of Alaska will increase 4 to 10 times by 1995. They also assume Alaska's population will at least double and per-customer use of electricity will double to triple in the next fifteen years. The Susitna project would generate an average of 6.9 billion kilowatt-hours (kwh) of power annually. This is about three times the power presently needed by railbelt utility consumers. Based on these questionable as-

by Jeff Weltzin and John Adams

sumptions, proponents of the project argue that a state-wide network, with Susitna as the first step, must be developed.

A project the size of Susitna could be just the beginning of an energy future for Alaska similar to that of the rest of the U.S.

Washington State is a good case-study.

have become the biggest wasters of electricity in the nation. Rather than increase the efficiency of their energy use, they have chosen a path of total-electric, poorly insulated homes and ever-increasing production. If Alaska chooses Susitna hydro, what comes next?

The past decades have seen powerful bureaucracies like BPA and the Tennessee Valley Authority (TVA) control the course of energy development throughout the lower 48.

the lower 48.

In 1976, the Legislature created the Alaska Power Authority (APA), to control State involvement in design, financing, construction and operation of the Susitna and other hydro projects.

The APA has recently proposed to connect Anchorage and Fairbanks with high-voltage transmission lines. This would be the first link in the Susitna project.

The APA is also overseeing feasibility studies of Susitna. Many people feel these studies are highly slanted toward a decision to build the project, without real consideration of the alternatives. (See "How to Short-Circuit A Study" - back



In just 40 years, under the Bonneville Power Administration (BPA), all the major hydro-power sites in that state have been developed. This has seriously depleted what once were the world's most productive fisheries.

The demand is still increasing and the public now faces the grim prospect of large-scale coal and nuclear plants. Why is this?

Believing in the myth of cheap, abundant, clean power. Washingtonians

page.)

Preliminary designs have already been completed for a transmission system connecting the major communities in Southeast Alaska. The next step would be to connect this regional power grid with British Columbia and energy-hungry states in the lower 48. The Railbelt network could also be connected with the Yukon Territory and British Columbia, setting the state for wholesale power export.

cont. on page 9

Poor Ole Alaska

The State of Alaska is embarrassingly wealthy. Decontrol of Prudhoe Bay oil has given the State a projected budget surplus of some \$4 billion, this year. Alaska's assets may soon be in the same class as the Federal deficit! One State consultant conservatively forecasts a surplus of \$18 billion by 1985. It's no wonder the rest of the world is calling us "the blue-eyed Arabs".

There's a bit of irony in all this. Alaska's runaway affluence is out of keeping with the image the State has tried to cultivate in its campaign against a strong National Interest Lands bill. Somehow the story about the poor, under-developed state being bullied around by

the Federal government isn't very convincing anymore.

The State has escalated its propaganda efforts, spending millions of its petro-dollars on Madison Avenue advertising and "the best lobbyists money can buy".

The goal is to convince Congress and people in the lower 48 that protection of the most outstanding remnants of America's natural heritage is a shameful "lock-up". Meanwhile, Alaskan Jaycees are gearing up for a tour of the nation in their gas-guzzling Winnebagos, presumably to prophesy energy disaster unless Alaska's wilderness is open to development.

We hear loud protests from those who claim Alaska is treated like a colony and Alaskans are "second-class citizens". Yet these same people persist in trying to push the North Slope Haul Road open as an unrestricted highway, despite almost unanimous opposition from Alaskan citizens who live north of the Yukon River.

Some complain about "excessive" Federal ownership of land and say the State can manage things better. But they ignore Alaska's generous statehood entitlement of 104 million acres - an area the size of California - which the State is subdividing and selling at the rate of 100,000 acres each year.

The State speaks out against certain Federal offshore oil sales, while quietly pursuing its own very ambitious OCS lease schedule. The State rushed ahead with its sale in the sensitive Beaufort Sea, above the protests of the North Slope Borough and villages. While professing concern for the marine environment, the State opposed the Borough's plan to balance oil development with fish, wildlife and subsistence values in the Beaufort.

The Governor recently met behind closed doors with Big Oil to plot a strategy, undoubtedly with an eye to opening the Arctic Wildlife Range calving grounds of the Porcupine caribou herd to oil development.

The State has joined hands with Anaconda Copper Corporation in a lawsuit to force large-scale mining into several National Monuments. The Alaska Power Authority continues to roll ahead toward State construction of the \$4.2 to \$6 billion Susitna hydro-project, the most expensive dam project in U.S. history.

The Legislature is laying plans to build an artificial-climate, Teflon-domed city at the base of Mt. McKinley. A major natural gas pipeline is on the horizon. Development is expanding in the State-owned Kuparuk oil field, west of Prudhoe Bay. And there's constant talk of such things as a World's Fair, winter Olympics and a major petro-chemical industry in Alaska.

Poor ole Alaska! It's rough being the richest state in the union.

But sarcasm aside, it's not a question of whether the State or the Feds are the "good guys" or the "bad guys". Things aren't that simple.

To trust one government more than another is to lose sight of the real issues confronting us and to forfeit control of our own future.

We must make our choices issue by issue, based on what we feel is best for Alaska's land, resources and people.

Speaking of our new wealth, State Senator Clem Tillion has said, "It will change the face of Alaska, in time". The difficult question we must answer for ourselves is this: "What do we want Alaska to become?"



THE NORTHERN LINE is published by the Fairbanks Environmental Center in cooperation with Students for Friends of the Earth at the University of Alaska at College, Alaska.

The FEC is a non-profit, educational organization dedicated to the preservation of the environment of Arctic and Interior Alaska and the wise management of our natural resources.

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Readers are encouraged to submit items for publication to:

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218 Driveway, Fairbanks, Alaska 99701

Letters should bear the writer's signature, but names may be withheld upon request. We reserve the right to edit letters to fit space requirements.

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Cover quote from "Front Lines"

1974 by Gary Snyder

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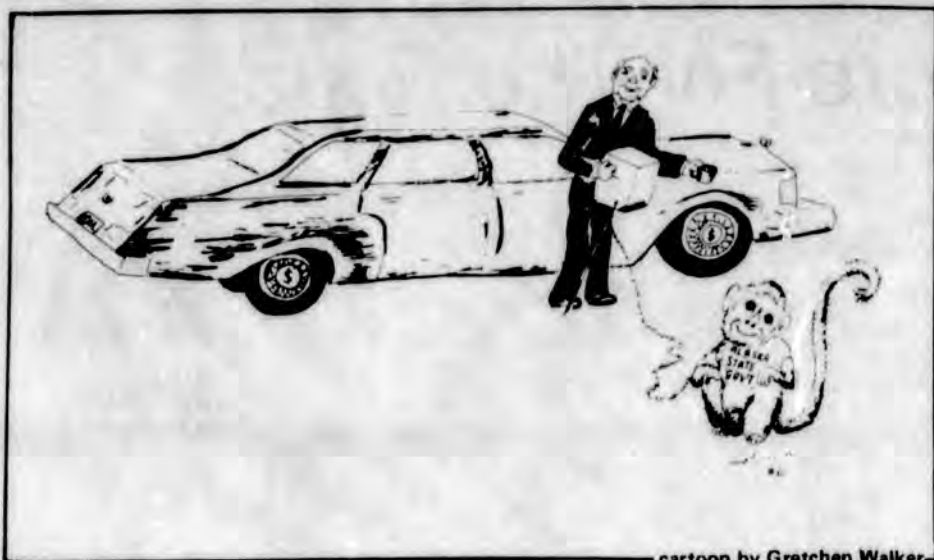
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John Adams

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cartoon by Gretchen Walker

Tokositna: Rustic Lodge or Teflon City?

Mt. McKinley National Park has been a major destination for Alaska visitors over the years, beginning with a small, locally-owned concession in the early 20's. The Park was created in 1917, but was seldom visited prior to construction of the Alaska Railroad. Once the railroad was in operation, tourists began arriving, often as a stop on the old Golden Belt tours, which used the Alaska Steamship to Valdez and Seward, then one way to Fairbanks via railroad, return to Valdez by the Richardson Highway bus.

Traveling in Alaska in those early days was an adventure in itself, for the railroad trip took two days, with an overnight stop at the old Curry Hotel, just across Curry Ridge from the Denali State Park. In Mt. McKinley National Park, no facilities existed at the railroad stop, and guests were transported by horse-drawn wagons or buses to a large tent-camp situated at the Savage River, where the public campground is located today.

Gradually facilities were extended out into the Park, first a camp at Igloo where horseback parties could overnight, then eventually a tent-camp with kitchen and dining room at the present site of the Eielson Visitor Center. The road was finally pushed through to Wonder Lake and the Kantishna mining community in 1938.

The trickle of Park visitors of these early days has expanded into a flood, and virtually no trip to Alaska is complete without a stay in the Park. This people-pressure has generated demands for additional tourist facilities and housing, which could be satisfied along the present Park road only at the expense of sacrificing both wildlife habitat (viewing wildlife is a major Park attraction) and scenic integrity in a land largely above treeline.

In response to the need for additional visitor accommodations, Park planners began looking over possible sites south of Mt. McKinley, first choosing one above Byers Lake on Curry Ridge, which commanded a sweeping view of the mountain and its southerly glaciers. This site is now within Denali State Park. Later, Brad Washburn suggested a site looking up the Tokositna Glacier, a spectacular view spot chosen by Sydney Laurence for his famous painting of McKinley. Washburn visualized a hostelry along European lines, with architecture blending into the surroundings, enhancing the wilderness experience of those who used it. Access could be afforded by upgrading the existing Petersville mining road, and adding a few miles to reach the lodge site.

Today, the admirable concept of a southern McKinley visitor center is lost in swirling controversy over the style and the magnitude of development desired. Senator Mike Gravel has interjected his own version, described as "Denali Recreational Community", a grandiose vision of a world-class downhill ski resort

as a focus for a high-density urban complex featuring commercial exhibition and convention centers, a golf and tennis center, and cultural and research institutes.

Since the cold and darkness of the sub-arctic location offer serious limitations to public acceptance of his scheme, Senator Gravel proposed to cover the entire city with a teflon dome, under which the climate would be controlled: buildings would thus require no insulation, the merrymakers could stroll in coatless comfort, and nature would be defeated.

Worse still, the Commission would eliminate the State Division of Parks and Recreation from any jurisdiction over the project, putting all authority in the hands of a group dedicated to promoting it.

As a result, Gravel's choice of contractor to design the project would prevail - he prefers The Architectural Collaborative, Inc., a world-wide firm with headquarters in Kuwait and Massachusetts, which specialized in designing luxury hotels for Arab billionaires.

Such pipedreams can be forgiven, especially during an election year, but this fantasy has mesmerized the lawmakers convened in Juneau, and is about to be immortalized in legislation - SB 481 and SB 482 passed the Senate with only one dissenting vote (and no debate) and are headed through the House Committees.

SB 481 creates a "Denali Recreation Community Commission" of five people, to direct studies and development of Gravel's proposal. Included among the commissioners would be (1) member

...this fantasy has mesmerized the lawmakers convened in Juneau, and is about to be immortalized in legislation...

of Alaska's Congressional delegation; (1) representative of the Alaska Visitor's Association (Gravel's campaign manager, Bill Sheffield, is currently director of AVA); (1) representative of the State Dept. of Commerce and Economic Development, and two unassigned positions.

The mandate for this Commission is to study the "economic feasibility" of the proposed cluster of centers for the "Denali Recreational Community" - no questions raised concerning environmental impacts or the suitability of this type of development in this wilderness setting. SB 482 would appropriate \$1 million to fund the Commission's work.

In ordinary times, a wild and irresponsible proposal on this scale would be no threat, simply because Alaska couldn't afford it. In these days, with legislators euphoric under the spell of windfall oil riches, fiscal responsibility can't be depended upon. It can happen here. Alaskans need to take the threat seriously, and make sure their legislators know how they feel.

One More For The Road!

Once again, Interior Alaskans have turned out in numbers to voice their opposition to opening the North Slope Haul Road to unrestricted traffic. In mid-April, at a teleconference hearing held in Fairbanks by the House Commerce Committee, the majority of those who testified spoke against opening the road.

The Committee was considering two bills. House Bill 552 would immediately open the road as a public highway all the way to Deitrich Camp in the Brooks Range, during the summer months. HB 965 would open the road to Coldfoot, (about 35 miles south of Dietrich), five years after completion of the Alaska natural gas pipeline. This bill would also prohibit State land disposals, off-road vehicles (except for access to mining claims) and hunting (except for subsistence) within ten miles either side of the road. HB 965 would also establish a special Commission which would conduct a review of the impacts of opening the Haul Road and make recommendations to the Legislature.

Supporters of HB 552 were allowed to testify first. William Woods, Mayor of Fairbanks and Executive Vice-President of the Fairbanks Development Corporation, claimed to represent "more than three-fifths of the voters in the area". He opposed HB 965, supported opening the road immediately and said he wants no restrictions whatsoever.

Tom Owen of the Fairbanks Chamber of Commerce spoke in favor of opening the Haul Road. He said the Chamber strongly opposes HB 965 and supports HB 552, although they feel there should be no seasonal restrictions on travel. Owen reminded the Committee of official Chamber resolutions to this effect which had already been submitted.

In testimony for the Fairbanks Environmental Center, Executive Director John Adams supported HB 965, but suggested some specific amendments. "It is our feeling that making a determination to open the road to any point whether Coldfoot or Deitrich or Prudhoe - is premature until the Commission (established in HB 965) has made its recommendations to the Legislature," said Adams. "We support the Commission idea, but feel the scope of its job must be broadened."

Rather than evaluate the effects of a pre-determined opening to Coldfoot, the Commission should fully investigate all options for management of the Haul Road and the social, economic, cultural and environmental costs of each", Adams said. He suggested that in the meantime the road remain open to industrial travel.

Adams also suggested the Legislature seriously consider the option of charging tolls on the road. "Tolls would remove the cost of maintaining the Haul Road from taxpayers and place it squarely on the shoulders of those who use the road", Adams said. "We could still allow for public use by tour buses, while minimizing the adverse effects".

Adams testified in support of a ban on all hunting in a zone five miles either side of the road. "The attempt to define subsistence (in HB 965) is well beyond the scope of Haul Road legislation", said Adams. "Native groups and local villages have publicly supported a blanket ban on hunting in the corridor".

Adams continued, "We view off-road vehicles as one of the most crucial points of the Haul Road issue. In order to minimize damage to the land and reduce pressure on hunting, fishing and trapping areas which are vital to villages in the region, a ban on recreational ORV's is absolutely essential".

cont. on page 8



drawing by Ingrid Lustig

Alaska Conservation Abstracts

BY FLORENCE COLLINS

"Possibly the most widely held fear of the Inupiat (Eskimos) toward Arctic oil and gas development is the slow 'destruction through insignificant increments' of Arctic wildlife habitat: cumulative impact." Previous environmental studies have dealt with catastrophic or single events and changes, but much wildlife "cannot cope effectively with long-term displacement."

"The relationship of the species with their environment---and the delicate timing involving ice movements, weather, nesting, moulting, calving, feeding, and migrating---have been balanced genetically over thousands of years and cannot be suddenly unlearned. Many wildlife species are endangered because of the fact that, genetically, 'they have nowhere else to go'."

"Also ignored has been the cumulative impact of 'industrial presence', which includes the chronic pollution of the environment through industrial discharge, small continuous oil spills from equipment and fuel transfer, and industrial air and noise pollution."

The Army Corps of Engineers plans to use the Prudhoe Bay waterflood project as a benchmark to calculate cumulative habitat impact from oil and gas operations on the Arctic Coast; this will be difficult, however, because original habitat values have not been quantified. *Arctic Coastal Management Newsletter*, April, 1980, p. 13.

GLACIER BAY HUMPBACK WHALES may be affected more by pleasure boats than by cruise ships; boat noises may disorient the whales in the rocky fjord, according to the National Marine Fisheries Service. *Alaska Magazine*, March 1980, p. A14.

Fourteen EXPLORATORY WELLS for oil and gas were drilled in Alaska in 1979, ten onshore and four offshore; all were dry. *Alaska Construction and Oil*, February, 1980, p. 38.

HAZE OVER THE ARCTIC OCEAN in recent springs is probably air pollution from Russia and Europe. *Alaska Magazine*, March 1980, p. 83.

BIRCH CREEK RAPIDS —
Muddied water can be a direct result of placer mining, making river travel more difficult because of hidden rocks.

(EDITOR'S NOTE: In the April edition of THE NORTHERN LINE, The Birch Creek Experience, Part I, was published. It addressed the water quality problems created by placer mining on Birch Creek. In Part II, we will learn the answers to questions such as who controls stream quality? aren't certain protections afforded a candidate wild river? and what rights do placer miners have?)



photo courtesy of BLM

The Birch Creek Experience, Part II ORV's Tear Up Proposed Wild River

by Steve Cook

Since Birch Creek has a long history of mining activity (since 1893), don't miners have "grandfather" rights to continue mining in the same manner as before? It appears the answer is no.

Public Law 92-500, the Federal Pollution Control Act Amendments of 1972, has set the standards by which to judge placer mining discharge. The intent is not only to stop new pollution but also to reduce existing pollution.

The Bureau of Land Management (the agency having jurisdiction over Birch Creek) has not demonstrated a willingness to take the lead in controversial matters of this type in the past, and is unlikely to do so here. This very lack of enlightened management by a multiple-use agency is contrary to its mission. By failing to monitor and reasonably control the placer mining activities within its jurisdiction, it appears BLM has become essentially a single-use agency - at least within the Birch Creek drainage.

The proposed wild river status requires BLM to manage the area in such a way that the river corridor is not impaired or degraded. Since the withdrawal is essentially to maintain the wild character of the river and adjacent lands, it would seem that random cross-country dozer travel and widespread ORV use (including four-wheel drive vehicles traveling the banks of Birch Creek) are degrading the resource.

These violations are well documented, yet they've been ignored. Emergency ORV closures, requiring permits for off-road travel, have been proposed but have gone nowhere. Surface mining regulations have been drawn up several times but have never been approved at the Washington D.C. level due to political pressure.

Of all the agencies involved in water quality, the Alaska Department of Environmental Conservation (ADEC) is the one with the most direct mandate to monitor and decide on applicable standards for placer mining. Except for very few instances, the State of Alaska owns the streambed of all navigable waters up to the normal, high water mark. Navigable used here is in the broadest definition, probably anything that will float a canoe.

The water quality standards set by ADEC are even used by EPA on permits issued for water discharge into streams. The permits presently state that the water discharge from a placer mine must

meet Alaska state standards for water quality.

Eventually ADEC will probably take over issuance of these permits, as has been done in other states. There is a possibility, as with BLM, that if ADEC proves itself incapable of administering a viable water quality program, EPA will step in and enforce the federal laws on a much stricter basis. And the miners will be the big losers.

Recreational use of streams has increased phenomenally, and based upon public interest, is a valid non-consumptive use of a resource. We are no longer living in times when a single resource use like placer mining can wash entire mountains away with no consideration given to its effect on other aspects of the natural environment.

Many placer miners are beginning to recognize this fact and are willing to comply with reasonable environmental regulations. But they need direction and guidance from ADEC. If ADEC lets the miners down, we may see ourselves with a situation similar to California, where surface mining permits state "the direct discharge of wastes to surface waters or surface water drainage courses is prohibited".

Historically, California and Alaska have experienced many parallel developments, with California being fifty years ahead of Alaska. Placer mining can have a place in Alaska's future, if approached from a multiple use point of view and not demanding to be the only valid use of streams.

There are few clear water streams in Alaska which are readily accessible for recreation or placer mining. On some sections of Birch Creek and the Fortymile perhaps the emphasis should be placed on placer mining, calling for a lower water quality standard, while in other areas like the Chena, Salcha and Chatanika river basins the emphasis should be placed on recreation, with a higher water quality standard applied.

The management and regulatory agencies need input from miners, fishermen, hunters, floaters and other interested parties to decide which stream use to emphasize in a given area.

The Kitchen Sink Trash and Treasure Sale

The FEC will be sponsoring a Trash and Treasure Sale on Saturday, June 14, from 10 am to 6 pm at the Center, 218 Driveway. All members are encouraged to bring their used items to recycle at our yard sale. Clothing should be clean, sized and on hangers (if needed). Suggested pricing will be appreciated on all items. If you would like to donate, drop your items by the Center beginning June 2nd, or call 452-5021 to have someone pick them up. Any larger items such as TV's, recreational items, furniture, etc. will bring the most to the Center, so please give generously.

If you do have an item you would like to donate, and you know it will bring prospective buyers, please let us know by late May so we can include these items in our advertising.

Retrofitting the Center

A committee was formed at the Annual meeting to retrofit the Center. This committee intends to paint the house and trim, rebuild and paint the fence, landscape the yard and plant a veggie garden, insulate the roof and basement, paint the inside walls, tear up the carpet and sand and varnish the beautiful wood floor underneath, build some stationary shelves in the library and fix our small plumbing problems.

Are you interested in volunteering some time? We need plumbers, electricians and carpenters! You don't have to be a professional. . . just call Cindy at 452-5021 to show your interest and talent!

We Need New Sign

The Center needs an artist to make us a new FEC sign to hang on our humble abode. If you have an interest in re-designing our nameplate, please contact Cindy.

Typesetting, Anyone?

Interested in learning the ropes of putting together a newsletter? Or if you already know the ropes, elevating it to the pinnacles of perfection?

We need a typesetter! If you are a very good to excellent typist and want to learn how to use a composer (typesetting machine), give us a call and try it out. It's a handy skill!

FEC Annual Meeting Held Kowalsky Honored/Committees Set

The FEC's 1980 Annual Meeting and Earth Day activities were highlighted by an award given to Jim Kowalsky for Conservationist of the Decade. Jim was honored with a short presentation by Celia Hunter, and several tokens of appreciation from the Center. Jim was one of the founders of the Center in 1971, and worked as its Director for most of the 70's. He was also the Alaska Representative for Friends of the Earth from 1971 - 1978.

The annual meeting culminated the Earth Day '80 activities sponsored by the Center and the Student Senate at the University of Alaska, Fairbanks. Activities included an Environmental Film Festival and exhibits from different environmentally concerned organizations and agencies. Hundreds of people filed through the exhibits and attended the films.

Over 50 FEC members attended the annual meeting held at Souvlaki's restaurant in downtown Fairbanks. A thirteen member board of directors was elected.

Molly McCammon received the Conservationist of the Year Award and Glynn Hoener received the Volunteer of the Year Award.

The main discussion of the evening centered on the FEC committees. Several new committees were set up, and established committees discussed. If you would like to serve on one of the following committees, please call Cindy at the Center, 452-5021.

suit of clothing? During the winter there were a few heat leaks and a good padding of insulation would do the trick. Work on the CENTER RETROFITTING COMMITTEE and you can also mend the fence, work in the garden, paint the inside of the Center and indulge in a veritable cornucopia of repairing and carpentry.

There have been rumors around town that a little greenery placed in strategic places would go far to make Fairbanks a more beautiful place. The GREENING OF FAIRBANKS COMMITTEE is committed to encouraging the City to plant trees and shrubs downtown.

Wolverines, foxes, walrus, voles, wolves, mountain goats. . . all these and more in our WILDLIFE COMMITTEE.

Have a special yearning for the bright lights of media? Well, then join our OUTREACH COMMITTEE! You too can bring the FEC into the limelight, let all those secret sympathizers out there know about the Center's activities and philosophy and bring them into the fold.

If you're an alternative energy aficionado, then the ENERGY COMMITTEE is

If you're an alternative energy aficionado, then the ENERGY COMMITTEE is land of a thousand dreams. Exploring energy alternatives for Alaska and keeping abreast of energy bills in the Legislature are the committee's two priorities.

Because of the complexities of FEC's three top priority issues, the HAUL ROAD, the SUSITNA HYDRO-PROJECT and STATE LAND DISPOSALS, special committees were set up to do research, send direct mailings and assist in any way possible. If any of these three issues especially concern you, join its committee!

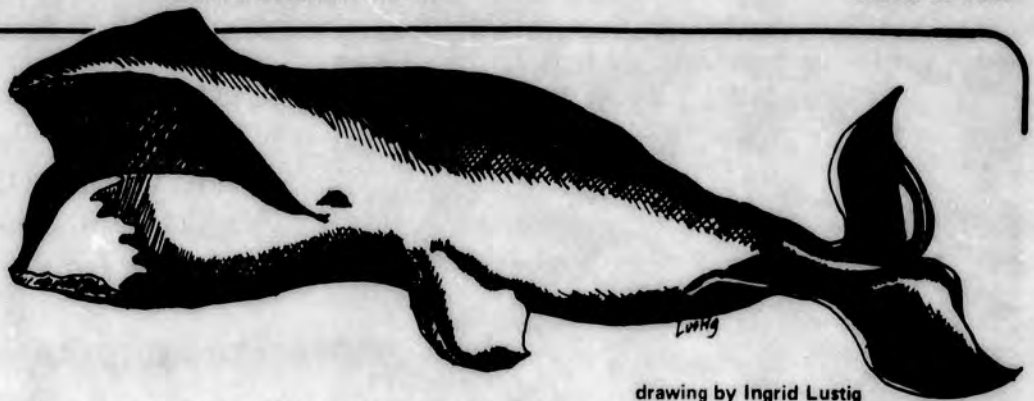
If grassroots fund-raising, organizing events like the Shrimp & Crab Feed and our upcoming Trash & Treasure Sale, and even grant-writing are your cup of tea, then join the FUND-RAISING COMMITTEE. The FEC needs you!

The FEC would like to thank and extend our congratulations to Jim Kowalsky, Molly McCammon and Glynn Hoener for all the work they have put into keeping Alaska alive and well.

Calendar of Events

- | | |
|---------|---|
| May 27 | Public hearing on State Power Development Plan, Alaska Court Building, 303 K Street, Anchorage, at 7 PM. |
| May 28 | Public hearing on State Power Development Plan, Alaska Court Building, North Star Borough, Fairbanks, at 7 PM. |
| June 5 | Public hearing on South Fairbanks Expressway, Ryan Jr. High School in Multi-purpose Room, at 7:30 PM. |
| June 14 | Trash & Treasure Sale at the FEC, 218 Driveway, Fairbanks. Lemonade and lots of items! Great prices! Stop by and bring your family. 10am - 6pm. |
| June 17 | Deadline for comments on Draft Environmental Impact Statement on Int'l Caribou Treaty (available from U.S. Fish & Wildlife Service or the FEC). |
| June 19 | THE NORTHERN LINE newsletter deadline. |

OCS Schedule Draws Fire



drawing by Ingrid Lustig

The Interior Department has unveiled its new schedule for oil and gas leasing on the Outer Continental Shelf (OCS). Under the plan, 36 OCS areas around the nation will be leased, by 1985.

Ten of the offerings will be in Alaska (see map). Eight of these ten sales will be in frontier areas which have never before been leased. The plan has been severely criticized by environmentalists and several states, including Alaska.

In the Alaskan areas, severe storms, sea ice and earthquakes present serious hazards, greatly increasing the chance of ac-

cidents and making clean-up virtually impossible in the event of well blowouts or other spills.

These areas also sustain large numbers of marine mammals, fish and birds, including endangered species. Many Alaskans depend on these resources for their cash income and subsistence. Scientific knowledge of most of the Alaskan areas is incomplete and technology for contending with the hazards is unproven.

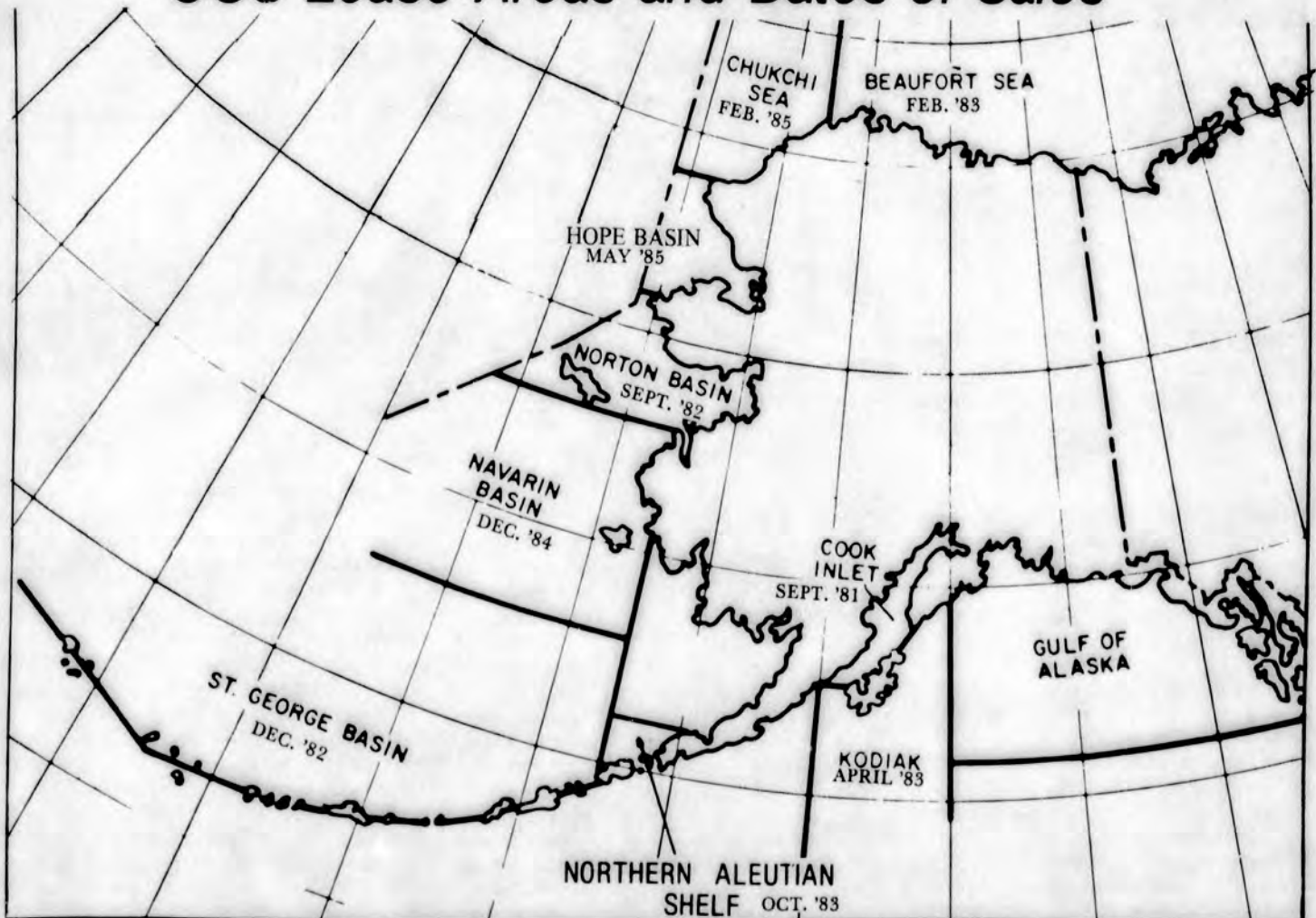
For these reasons, the FEC and other environmental groups urged omission of the Chukchi Sea, St. George Basin, Navarin Basin, Norton Basin and North-

ern Aleutian Shelf (Bristol Bay) sales from the schedule. The State of Alaska also requested indefinite postponement of the North Aleutian, St. George Basin and Chukchi sales.

But the OCS schedule has been approved by President Carter and passed on to Congress for final approval. The State of California is preparing a lawsuit to challenge the plan and national environmental groups are also investigating legal options.

Meanwhile, Alaskan environmentalists are gearing up for a long series of struggles around Alaska's entire coast.

OCS Lease Areas and Dates of Sales





*Give your approval to all you
cannot understand.
Praise ignorance, for what man
has not encountered
he has not destroyed.
Ask the questions that have
no answers.
Invest in the millennium.*

---Wendell Berry

photo by John Adams

State Lands Bills Stalled

Two bills currently pending in the Legislature would make several major changes to the State land disposal program.

House Bill 946 would, among other things, repeal the 100,000-acre annual disposal quota, include agricultural land in the "land bank", limit the density of parcels in remote disposal areas and reinstate local government planning and zoning authority.

HB 855 would establish local citizen advisory committees to make recommendations on land disposals to the Department of Natural Resources.

The Fairbanks Environmental Center is supporting both these bills. In recent comments to the House Resources Committee, the FEC stated, "The 100,000 acre disposal quota... has been the root of many problems."

"This arbitrary figure has no relation to the real need for land. With such a large amount of land to be disposed of each year, the Division of Lands simply cannot perform adequate planning and public involvement. In our opinion, repeal of the quota is the most significant and positive feature of HB 946."

The FEC has frequently spoken out concerning the need for more localized

decision-making on land disposals. Last December, the Center sponsored a meeting of Interior Citizen leaders to discuss the disposal program and its problems.

One of the recommendations from that meeting called for local advisory committees to be established.

Although HB 946 and 855 have received the support of Native groups and municipalities, these bills appear to be stalled in committee. Alaskans should let their legislators know their feelings about these bills before this session ends.

One More . . .

cont. from page 4

Concluding the Center's comments, Adams said, "I would like to reiterate our support of HB 965, but emphasize our opposition to any measure which would open the Haul Road even partially before a full evaluation of management options is completed".

Gretchen Walker, President of the Center, pointed out the problems with unrestricted traffic and caribou movement. Fred Brown, Chairman of the Commerce Committee, responded by discussing his early experiences in McKinley Park. Brown said he didn't think their

car bothered the abundant caribou herd. Ms. Walker pointed out the herd he referred to is now on the verge of extinction.

Eddie Bergman, a Native Alaskan from Allakaket, expressed his concern about increased hunting and fishing pressure.

Spud Williams, President of the Tanana Chiefs Conference, supported Bergman's testimony and went on record opposing any opening of the road.

However, Williams said a compromise was reflected in HB 965.

Williams also explained that the State does not recognize the present need for money to improve airports and roads in the rural areas, and that money spent on the Haul Road would probably be interpreted as being spent on rural Alaskans, even though they don't want the road opened.

Throughout the 3-hour hearing, people pointed to the effects on fish and game, hazards to public safety, opposition of local residents and waste of fuel as reasons not to open the Haul Road.

The need for control of hunting and off-road vehicles in the Corridor was repeatedly emphasized.

Despite this strong public input to the contrary, several days later the Commerce Committee passed HB 552. That bill has moved on to the House Finance Committee.

Non-Game Program On Horizon

by Marilyn Sigman

"Nongame" has not exactly become a common household word this year, but it is on its way to a place in the management scheme of the Alaska Department of Fish and, uh, . . . Game. For those who came in late, "game" legally, in the State of Alaska, includes all animals except those currently domesticated.

Thus, the escaped pheasant or feral ferret are legally game animals, as well as the MacNeil River bear and the gray-crowned rosy finch. The term "nongame" has been coined to describe those wild vertebrate species (birds, mammals and amphibians) not traditionally harvested by humans, many of which are valued for ecological or aesthetic reasons.

Game management has been traditionally funded by the fees and special excise taxes paid by hunters, trappers and fishermen. The so-called nongame species, some 90% of all fish and wildlife species, often receive little management attention unless they are endangered. The major emphasis of nongame legislation has been to provide an alternate source of funds for the management of nongame species especially to make more funds available to the state agencies to provide opportunities for the public to observe, photograph, or study wild animals and to learn about natural history.

Another 4-Lane For Fairbanks?

The Department of Transportation recently released a draft Environmental Impact Statement on the proposed four-lane highway through south Fairbanks.

The proposed highway would connect the Parks highway to the Richardson highway. Alternatives being considered include: doing nothing; constructing one of four routes being considered; postponement; phase development, and development of other modes of transportation.

Two issues which have generated controversy are air quality and strip development along the proposed route.

A public hearing for this project is scheduled for June 5, at 7:30 PM in Ryan Jr. High School, Multi-purpose room.

Written comments should be sent to: Alaska Department of Transportation, 2301 Peger Road, Fairbanks, AK 99701, by July 7, 1980.

A copy of the draft EIS is available for review at the Center.



drawing by Gretchen Walker

A bill which would fund conservation planning for nongame passed the U.S. House in July, 1979. A similar bill which would fund planning and implementation of projects was, at last report, still in the Senate Environment and Public Works Committee.

Power Grab . . .

cont. from page 1

This could lead to damming more major rivers such as the Stikine, the Copper and Yukon to ship power Outside. Besides the obvious environmental losses, this would make most Alaskans dependent on a centralized, "master-circuit" controlled by a single government agency - the Alaska Power Authority.

Underlying this energy future is the worn-out assumption that we must have ever-increasing energy consumption to have a rising standard of living. This assumption is at the root of our present national energy problems. We Alaskans pride ourselves on our independence and doing things differently. Do we really want to repeat the same old mistakes?

Most Alaskans want to see more efficient use of electricity. But they also know that we now use oil and gas for 85% of our electrical generation. Clearly, we've got to find a way to kick this expensive habit. Hydro power can play a major role in a transition to an energy future based on renewable resources.

Construction of smaller-scale local and regional projects would make Alaskan communities more self-sufficient and encourage more efficient energy use.

Regional hydro projects cost less, are less environmentally destructive and can be brought on line quickly. We could build these projects to fit our real needs, rather than building enormous projects to fit inflated projections. A real commitment to making our homes and buildings more efficient would go a long way to-

Meanwhile, local legislators have worked to appropriate general fund monies for three nongame positions within ADFG. These positions appear in the House version of the budget, but not in the Senate version.

The outcome of the free conference committee hearings will determine whether this year will see the beginning of a nongame program.

Right now, support is needed to get the Senate bill (S 2181) moving. Please write Senator Gravel, who supported the bill in subcommittee hearings, to voice your support and urge its passage.

As for the state legislature, there's always another session and game management is likely to continue to receive a lot of attention.

An Alaskan nongame management program still has several legislative hurdles to clear, but it appears within the realm of possibility.



ward keeping our consumption at reasonable levels.

Since 1975, Fairbanksans have shown individual conservation efforts can dramatically reduce energy use. For the last four years, the per-customer rate of consumption at the State's second largest utility, Golden Valley Electric Association (GVEA), has decreased by an average of 12% a year.

As a result, GVEA used less than 40% of its installed generating capacity in 1979. This has eliminated the need for new generating capacity until sometime after 1990.

In the same period, the number of insulation businesses in Fairbanks has dramatically increased. Alaskans are learning a kilowatt-hour saved is as useful and cheaper than a kilowatt-hour produced.

We have a choice. We can assume rapid growth in Alaska's population and consumption, build on Susitna hydro and put our energy future in the hands of the APA. If we choose this path, it could lead to damming most of our major rivers and eventually to large-scale coal and nuclear power plants.

We could also choose a path based on smaller-scale, decentralized hydro projects, generation from waste-heat and other locally appropriate technologies and increased efficiency. This path could lead to a future where our major rivers still run free and Alaskans continue to enjoy lifestyles of self-sufficiency and independence.

The Acres Plan

How To Short-Circuit A Study

Last year, the Alaska Power Authority (APA) hired Acres American, a New York based engineering firm, to conduct feasibility studies of the proposed Susitna River hydro-electric project. Since then, the APA has repeatedly assured the Alaskan public that the Acres studies will take an in-depth look at the many economic and environmental questions surrounding the Susitna project and seriously consider all possible alternatives.

But an independent consultant hired by the State Legislature disagrees. In a recently released report, ("Susitna Hydro-Power: A Review of the Issues"), economist Arlon R. Tussing strongly criticizes the Acres plan of study. Tussing points out fundamental biases and numerous inadequacies which confirm what environmentalists and others have suspected all along: The Acres plan virtually guarantees a decision to build the Susitna project.

The Tussing report concludes that: "The substance and sequence of work tasks... strongly imply that Acres and possibly the Power Authority have already decided... that the project should go ahead."

Evaluation of the real need for Susitna power and possible alternative power sources will only be given lip service. The 2½-year study schedule is designed in a way that precludes serious evaluation of these crucial questions.

Most of the \$30 million Acres budget will be spent on detailed technical and engineering studies of the Susitna project. Only about 1% of the total will be spent on electrical demand and alternative studies.

The real decision on whether to build the Susitna project will be based on incomplete information. At the heart of the Acres plan is a "Go - No Go" decision to be made early next year. Officially the Power Authority says this will only be a decision on whether to proceed with the studies. But Eric Yould, Executive Director of the APA, has publicly said that this decision will in fact be interpreted as the final decision on whether to proceed with the project, (Anchorage Daily News, "Dambackers speak out").

A "Go" decision at this point will guarantee increased political momentum to fund construction of the Susitna project, before the studies are even half-completed.

Almost all the studies after the "Go - No Go" decision will be geared toward meeting the requirements of a Federal license needed to build Susitna. Yet this decision will be made before the environmental and economic studies are complete. Clearly, the real purpose of the Acres studies is to get a license to build the Susitna project.

The 90-page Tussing report highlights many other problems in the Acres/APA plan and makes specific recommendations for revising the studies. Most significant is the recommendation that an additional \$1.2 million be spent for expanded studies of electrical demand and alternative energy sources. This must be done before a rational decision can be made about the Susitna project.

Chena Rec Area Endangered

The authority of the Alaska Division of Parks to regulate off-road vehicle use within the Chena River Recreation Area would be severely limited by two bills which have passed the Senate.

SB 537 would forbid Parks to restrict or prohibit the use of any motorized vehicles, either on or off-trail, within 5,200 acres between Colorado Creek and Four Mile Creek.

A more general bill, SB 536 would forbid regulations prohibiting or restricting traditional use, including motorized use, of roads and trails which existed before an area was established as a state recreation area.

If this legislation becomes law, it could not only open up the Chena River Recreation Area to serious environmental degradation, but also could make it difficult if not impossible to zone for mechanized and non-mechanized use.

Closing out future use options in this manner would be inadvisable in light of an active master planning effort presently ongoing for this area.

Based on Tussing's findings, the FEC is urging the "Go - No Go" decision be re-scheduled for June 1982. An earlier decision would be based on incomplete information and could commit Alaska to the Susitna project without a full evaluation of the real need, environmental impacts and alternatives.

The Center also supports continued oversight of the studies by the House Power Alternatives Study Committee. This committee, which contracted the Tussing report, serves as an independent perspective to balance that of Acres and the APA.

The Susitna studies are really a "de-facto" energy policy. The choice we make now will largely shape the energy future of Alaska. It is essential to base our choice on a thorough, objective evaluation of all possible energy futures, not on a pre-determined decision to build the Susitna project.

SB 536 defines traditional use as one which occurred regularly before establishment of the recreation area. However experience has shown the Division of Parks that ambiguous terms like "regular use" and "occurring regularly" will be interpreted in an all-too-liberal way by off-road vehicle advocates.

Under SB 536, even the most obscure remnant of a trail could in reality be open to motorized vehicle use.



Gretchen Walker

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energy & society

Editors: GEORGE H. DANIELS and MARK H. ROSE, *both of the University Program in Science, Technology, and Society, Michigan Technological University*

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- the optimal roles of researchers, business, and government in energy development, production, and distribution;
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- ways in which countries around the world are dealing with energy challenges;
- the environmental implications of current energy use, technological developments, and the use of alternative forms of energy; and . . .
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MARK H. ROSE is Associate Professor of Technology, Science, and Society at Michigan Technological University. The current editor of *Energy History Report* (a publication of the U.S. Department of Energy), he has done extensive research on urban energy, and on energy choices and the economic and social patterns of five U.S. cities. He is the author of *Interstate: Express Highway Politics, 1941-1956*, and of a number of articles dealing with urban producers and users of light, heat and power; highway politics; and America's first energy crisis. He received his Ph.D. in History from The Ohio State University.

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The editors of *Energy and Society* seek original work that focuses on the social and institutional dimensions of energy production, distribution and consumption. Although articles may be disciplinary in orientation, they must be accessible to readers informed on energy issues, including specialists in business, government, and the social sciences. In essence, the goal of the journal is to serve the growing interest in energy systems by providing an interdisciplinary arena for examining the institutional networks that surround and affect energy development, both through time and across national borders.

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JOBS:

How Many, What Kind, For Whom?



When a new shopping center is proposed or an industry plans to relocate in your area, it is usually promoted by "pro-growth" advocates as being good for the community because it will boost the local economy by supplying more jobs. But developers are often reluctant to say that those new jobs will be taken by outside professionals transferred from other branches of the company; rather than providing jobs for local residents they may just be promoting undesirable expansion.

The number of jobs to be created directly by the project and other information can be obtained from the project's promoters. Secondary sources include the Censuses of Manufacturing, Retail Trade and Population, Bureau of Census and other Department of Commerce publications. The Department of Labor publishes employment data with industry and county breakdowns.

Similar publications might be available from state and local government agencies, trade associations, labor unions and the Chamber of Commerce. Local government planning documents usually are supported by statistical compendiums, and local colleges or universities often have studies with unique local data which can be used for the

Employment Impact Statement (EIS).

Do not overlook the importance of "hunch" estimates, so long as there is logic behind them. The fancy "models" used by economists are nothing more than hunch anyway, although they are dressed up in language and symbols designed to make us think they must be scientific because we don't understand them. Some answers will have to be judgmental by their natures. The important thing is to be consistent in reason and method.

The sample questionnaire presented here goes beyond assessing a project by the number of jobs created; it addresses the qualitative aspects of employment as well. Consequently, the EIS does not have a built-in judgment about what sorts of impacts are "good."

Some projects or programs, for example, might produce more jobs than others—a quantitative measurement—but may be unacceptable on qualitative grounds. Evaluation of EIS findings is a matter for local debate based on local values and objectives. The purpose of the EIS is to provide a consistent and meaningful informational basis for discussion and for rational choosing among options.

Avrom Bendavid-Val

RESOURCES

Several publications of the Center for Advanced Computation, University of Illinois, Urbana, IL 61801, provide interesting data on the shifts in numbers and kinds of employment as well as energy use resulting from reallocation of funds from one kind of priority, such as highway construction, to other uses:

"Job Impacts of Alternatives to Corps of Engineers Projects" by Hannon and Brezdek, **ENGINEERING ISSUES**, Oct. 1973, pp. 521-31, American Society of Civil Engineers, 345 E. 47th Street, New York, NY 10017. Shows that transfer of funds from ACE projects to national health insurance, social security payments, mass transit development, construction of sewage plants or general tax relief would provide significant increases in employment, and shows that specific Corps projects may not even benefit nearby local communities.

"Options for Energy Conservation," Bruce Hannon, **TECHNOLOGY REVIEW**, February 1974.

Provides information on energy and employment intensity per dollar of product for many industries, for different food products providing equal protein and for household expenditures.

Also:

MANPOWER REQUIREMENTS FOR NUCLEAR AND COAL POWER PLANTS, free from **CRITICAL MASS**, 133 C Street S.E., Washington, DC 20003. Comparison of employment impacts over the lifetime of alternative processes for producing an identical product indicate that coal power will result in 40% more employment than nuclear power, while costing less.

The higher costs to a community resulting from any kind of economic growth is described in several publications:

"Santa Barbara—The Impacts of Growth," reprinted in the **SECOND ALTERNATIVE PUBLIC POLICY READER**, Shearer and Webb, ed., \$7.50 from the Institute for Policy Studies, 1901 Q Street N.W., Washington DC 20009.

A solid and straightforward discussion and analysis of the questions people have about growth and growth management in a community.

THE COST OF URBAN GROWTH: OBSERVATIONS AND JUDGMENTS, Richard Bradley, 1973, \$2.32 from Pikes Peak Area Council of Governments, 27 East Vermijo, Colorado Springs, CO 80903.

Demonstrates that larger cities and faster growing cities cost more to live in and have fewer amenities.

The economics and community benefit of smaller scale, locally-owned business and industry is nicely explained in:

SIZE, EFFICIENCY AND COMMUNITY ENTERPRISE, Barry Stein, 1974, \$5 from the Center for Community Economic Development, 639 Massachusetts Ave., Suite 316, Cambridge, MA 02139.

Recent studies by the Institute for Local Self-Reliance analyze the economic impact on a specific neighborhood of different size businesses, outside ownership of enterprises, and the role of banks in directing deposited money out of the neighborhood into other investments:

"The Adams-Morgan Business Sector: Paying for Other People's Development," \$1 from the Institute for Local Self-Reliance, 1717 18th Street N.W., Washington, DC 20009.

EMPLOYMENT IMPACT STATEMENT

JOBS CREATED

1. How many new local jobs will be *directly* associated with the proposed new facility (program, project, etc.)?
2. How many new local jobs will be created indirectly by local purchases of supplies and services by the new facility?
(This can be roughly calculated by: (a) obtaining estimates of the new facility's annual local purchases of supplies; (b) figuring the proportion that will go to pay the wages of new workers that local suppliers will have to hire to handle the increased business; (c) and then dividing by local average wage, to convert the dollar figure to a jobs equivalent. Consistent and reasonable "guesstimates" are OK.)
3. How many *induced* local jobs will the new facility generate?
(This can be roughly calculated by: (a) estimating the percentage of new direct and indirect payrolls that will ultimately become local personal expenditures by workers; (b) figuring the proportion that will go for wages of new workers that local retailers will have to hire to handle the increased business; (c) and dividing by the average local wage to convert the dollars to job estimates.)
4. Total number of jobs created:
(direct + indirect + induced = total)
5. How many jobs will the new facility eliminate—directly or indirectly—in other local businesses?
6. NET number of jobs created:
(number of jobs created minus number of jobs eliminated)

Proposed Project

Alternative Processes

Alternative Investment

ALTERNATIVES

1. What are the employment impacts of alternative means of providing the same services?
(These alternatives can be different production processes—such as employing bank tellers instead of computers to process checks—or different institutional arrangements. Small, locally-owned shops keep business profits within a community, where they provide indirect and induced jobs, while large, outside-owned franchises remove profits—and induced jobs—from the community and frequently purchase supplies from outside suppliers they own, reducing indirect jobs in a community.)
2. What are the employment impacts of alternative uses of the same investment resources? (particularly if public funds)
Almost any expenditure of money creates jobs, but using that money for different purposes may have very different results while providing the same amount of jobs. Building new power plants provides jobs and insulating homes provides jobs, but only the latter eliminates need for unnecessary future expenditures of work, dollars and energy. Expenditure of tax money provides jobs but raises our taxes, giving us each less to spend, which would have provided jobs anyhow. And expenditures for different purposes provides very different numbers of jobs and use of resources. Hospital services provide three times as many jobs per dollar spent as highway construction. Expenditure of funds for waste treatment construction, social security benefits or national health insurance instead of present Army Corps of Engineers projects would provide 30 to almost 60% increases in employment.

COMMUNITY IMPACTS

- COMMUNITY IMPACTS**

 1. What special conditions will be required to sustain the activity being planned? (Do the product produced and the proposed rate of resource use indicate sustainable operation? Are special markets, government subsidies, local resources, abnormally low local wages necessary?)
 2. Are the activity and the jobs it creates seasonal or cyclical over a longer period of time?
 3. How many of the new jobs created will be permanent?
 4. How many of the new jobs will be temporary? (e.g., associated only with construction or initial operation)
 5. What will happen to workers in temporary jobs when their work ends?
 6. What will be the distribution of new jobs among types and wage levels?
Type of job Wage Number Percent of Total
 7. Will the income distribution of the jobs provided increase inequality of wealth in the community?
 8. How many of the new jobs are likely to be filled by local unemployed people?
 9. How many of the new jobs are likely to be filled by workers whose employment has been terminated, directly or indirectly, because of the new facility?
 10. How many of the new jobs are likely to be filled by local residents? How many by newcomers?
 11. How many of the new jobs are likely to be filled by men? women? minorities?
 12. Will the new facility make it harder for people without special education or training to get jobs in the community?
 13. Will the new facility make local employment more dependent on outside decisions that don't incorporate the needs of the community?
 14. Will the financial base of the new project make it comparatively harder for small local industry to compete fairly for loans?

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

500A Chestnut Street Tower II

November 24, 1980

Mr. Mark Wittow
Study Coordinator
Power Alternatives Study Committee
1024 West 6th Avenue
Anchorage, Alaska 99501

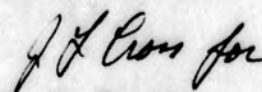
Dear Mr. Wittow:

Thank you for your letter of October 14, 1980. The Tennessee Valley Authority has had the opportunity to review the reports and studies which were sponsored by the Power Alternatives Study Committee of the Eleventh Alaska Legislature. It is readily apparent that a very comprehensive analysis has been performed by the study committee. The final report clearly demonstrates that the major issues have been identified and addressed. A satellite issue which may have some impact on your decision is the potential future value of coal exports to such countries as Japan. Hydroelectric development could free coal resources for export.

Once again, we commend the quality of your study and appreciate the information which you have provided us.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



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October 29, 1980

Mr. Arlon R. Tussing
Arlon R. Tussing & Associates
2720 Ranier Bank Tower
Seattle, Washington 98101

Dear Arlon:

Thank you kindly for your thoughtful letter of October 13 along with your analytical report on Susitna Dam.

Isn't a shame that hearsay evidence is used so badly. Frankly, Arlon, I have no recollection of even discussing your report on Susitna Dam with anybody, let alone allegedly denouncing it (vehemently too!) to anybody.

In the course of the A.N.D. litigation, I have perceived a personal and most favorable intellectual dimension of you I was heretofore completely unaware of.

I've carefully read your report. If I can summarize it with one concise thought, I can honestly say you've convinced me, at the very least, that the "ACRES" study lacks much credibility. When the makeup of that study group and circumstances under which it was awarded to them are considered, one can understand why.

You're to be particularly commended for printing the critique of your own report by Eric Yould as an exhibit to yours. This is professional class and manifests self-confidence and objectivity.

As you know, I am expressing these reactions with some degree of knowledge of the subject matter; as you know Ernest Gruening appointed me to the 1965 Rampart Dam advisory group and in that process, I did become familiar with studies of hydro projects.

Mr. Arlon R. Tussing
October 29, 1980
Page Two

Knowing that Chugach Electric is not at all enthused about the Susitna matter basically because of Beluga and natural gas and the general conservativeness of their management, I am, like you, also concerned about Susitna's market; however, I hope that somehow, someday Susitna will be built as a prudent use of our non-renewable resource money for future generations.

Again, Arlon, thank you for your kindness in writing.

Sincerely,

A handwritten signature in dark ink, appearing to be 'E. Merdes', written in a cursive style.

Edward A. Merdes

EAM/lw

STATE
of ALASKA

MEMORANDUM

TO: [Jessie Dodson

DATE: June 9, 1980

FILE NO:

TELEPHONE NO:

FROM: Tom Singer
Policy and Program Specialist
Division of Policy Development
and PlanningSUBJECT: Susitna Plan of Study
Management Options

There are two basic decisions before us:

1. Who should perform the power market and alternative supply studies, serving as prime contractor for and integrator of load forecast, supply alternative, and system optimization analyses. Acres is no longer considered a viable alternative as prime contractor for Task I studies due to legislative intent, Tussing recommendations, etc.

A related question is who should perform the non-Task I related Tussing recommendations (see Tussing p. 101 recommendations #6 and #9).

2. Who should manage the performance of these studies.

Options1. Task Performance

- a. Woodward-Clyde becomes prime contractor for power market and alternative supply studies, utilizing input developed by ACRES (underway) and other subcontractors such as ISER;
- b. Competitive bid via RFP process;
- c. Sole source negotiated contract with firm chosen following joint APA/Governor's office nation-wide search;
- d. ACRES/APA continues work with some portion of funds appropriated to Governor's office. Balance used by Governor's office to perform second "alternative" alternatives studies (i.e., competition); or
- e. Other

2. Contract management

- a. Governor's Office staff manages contracts (i.e., Jessie, Bob etc.).

- b. DPDP manages contracts
- c. Budget and Management manages contracts.
- d. Special Projects Office manages contracts.
- e. Governor's Office RSA's funds to APA to manage contracts.
- f. Governor's Office RSA's funds to another entity of state government to manage contracts.
- g. Governor's Office hires personnel (or contracts for project manager) to manage contracts.
- h. Other

Attached please find:

1. Arlon Tussing's list of POS revisions, for which \$1,365,000 was appropriated in FCCS HB556.
2. ACRES POS description of Task 1 and funding levels.
3. Budget allocation to Governor's Office for Susitna planning.

cc: Fran Ulmer
John Halterman

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ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES

POWER ALTERNATIVES STUDY COMMITTEE

Representatives Hugh Malone and Brian Rogers, Co-Chairmen

October 14, 1980

Enclosed are several reports sponsored by the Power Alternatives Study Committee of the Eleventh Alaska Legislature. (A short summary of the work is provided in the committee's final report, also enclosed.) The reports discuss and analyze energy issues in Alaska, focusing on future energy demand in the Railbelt area of Alaska and possible alternatives to the proposed Susitna Hydroelectric Project. Although the committee formally disbanded in June 1980, the analysis of electric power alternatives is being continued by Batelle Northwest, under a contract with the Office of the Governor. Continuing oversight of the Susitna project is being conducted by the House Research Agency.

One report sponsored by the committee has not yet been completed: a paper evaluating the potential for coal and natural gas-based power generation in the Railbelt area, by economist Gregg Erickson. Those of you wishing to receive this report should write directly to Mr. Erickson at 316 Coleman Dr., Juneau, Alaska 99801 (907-586-1954). His report should be distributed in early November.

I would appreciate receiving any comments you have on the reports or the work of the committee, at the address given below. Additional copies of the reports are available from Lynn Strauss or Debi Smith at the Juneau Legislative Information Office, Pouch Y - State Capitol Bldg., Juneau, Alaska 99811. (Some of you may have already received one or more of the enclosed reports. If so, please pass the extras on to a local library or some other person who can use them.)

Sincerely,

A handwritten signature in cursive script, reading "Mark Wittow", is positioned above the typed name.

Mark Wittow
Study Coordinator
1024 West 6th Ave.
Anchorage, Alaska 99501

Copies of the following committee reports are available from Debi Smith at the Juneau Legislative Information Office, Pouch Y, 99811 (465-4648)

1. ELECTRIC POWER CONSUMPTION FOR THE RAILBELT: A PROJECTION OF REQUIREMENTS
(By Scott Goldsmith and Lee Huskey, Institute of Social and Economic Research, Univ. of Alaska, June 1980, 71 pp.) A 400 page set of technical appendices for this report is also available.
2. AN EVALUATION OF THE I.S.E.R. ELECTRICITY DEMAND FORECAST
(By Crow, Mars and Conway, Energy Probe, Canada, July 1980 , 62 pp.)
3. A REVIEW OF ELECTRIC POWER DEMAND FORECASTS AND SUGGESTIONS FOR IMPROVING FUTURE FORECASTS
(By Bradford Tuck, Univ. of Alaska, May 1980, 73 pp.)
4. INTRODUCTION TO ELECTRIC POWER SUPPLY PLANNING; WITH SPECIAL ATTENTION TO ALASKA'S RAILBELT REGION AND THE PROPOSED SUSITNA HYDROELECTRIC PROJECT
(By Arlon R. Tussing and Assoc., May 1980, 103 pp.)
5. ENERGY ALTERNATIVES FOR THE RAILBELT: A STUDY OF END-USE STRUCTURE, ENERGY CONSERVATION POTENTIAL, ALTERNATIVE ENERGY RESOURCES AND RELATED PUBLIC POLICY ISSUES
(by the Alaska Center for Policy Studies. Anchorage, August 1980, 479 pp.)
6. ALASKA COAL: ALTERNATIVES FOR THE RAILBELT
(By Gregg Erickson and Fred Boness) (with)
ALASKA NATURAL GAS: ALTERNATIVES FOR THE RAILBELT
(By Gregg Erickson, October 1980, app. 70 pp.)

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ANALYSIS OF
POLICIES AND RECOMMENDATIONS
BY THE STATE ENERGY POLICY
COMMITTEE

JANUARY 31, 1979

Alaska State Legislature

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January 31, 1979

TO: The Honorable Jay S. Hammond
Governor

The Honorable George Hohman
Chairman, Legislative Council

FROM: Bill Miles, Chairman *BH Miles*
State Energy Policy Committee

Pursuant to the guidelines established in HCR 67 passed during the first session of the 10th Legislature, I present for your consideration the final report of the State Energy Policy Committee.

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APPENDICES

The Reserve For Energy Facilities
Development Account

SCS CS HCR 67

Bibliography

SECTION I

INTRODUCTION

The State Energy Policy Committee was created during the first session of the 10th Legislature through HCR 67. The Committee consists of three members of the Senate appointed by the President, three members of the House appointed by the Speaker, the Commissioner of the Department of Natural Resources, the Commissioner of the Department of Commerce and Economic Development plus four members appointed by the Governor.

HCR 67 was introduced in recognition of Alaska's need to begin developing a coordinated policy concerning in-state energy needs, and the development of energy resources which will augment national energy supplies. The mandate of the resolution charges the Committee to "identify the problems and initiate solutions with respect to the development of a viable overall energy policy."

The work done to date represents the first step in developing an overall energy policy. Given the depth and complexity of the subject and the changing state and federal needs, this report and the recommendations made by the Committee must be viewed as only the first step in the direction of formulating an "overall policy." It would be a mistake to evaluate this report and its suggestions as the final word on an in-state energy policy. However, many of the policies and suggestions should be studied and evaluated in light of current needs and future expectations. The

report provides a useful starting point in coming to terms with some of the problems the state now faces regarding its energy resources and its energy needs.

SECTION II STUDY APPROACH

The publication and dissemination of "Alaska's Energy Policy: Issues and Options", outlined, in brief, the issues which the State must deal with in order to begin developing a State energy policy. The report points out that energy policy needs be aimed at two areas: 1) How should the state deal with in-state energy needs? 2) How should the state develop energy resources which are surplus to in-state needs? The overall purpose of "Issues and Options" was to inform the public and urge public participation.

For in-state use, "Issues and Options" outlined two approaches. These were referred to as the "Hard Path" and the "Soft Path." The Hard Path places continued reliance on large centralized power grids. Fuel sources would continue to be fossil and large hydroelectric with a future shift to nuclear. This path is consistent with industrial expansion and growth in energy demand. The Soft Path would promote energy conservation and the development of appropriate technology. In the future the state would shift to renewable fuels like solar, wind and small hydro-

electric, with a lessening dependence on the large power grid networks.

For policies related to the development of energy resources which are surplus to in-state needs, "Issues and Options" points out that the state has two paths here as well. Policies can reflect a laissez faire attitude with minimal state participation, leaving the responsibility for a development of energy resources with the private sector. Or the state can take a more active role, share some of the risk and maintain a more responsible, regulatory position. The key is maximization of net benefits. That is, what balance between these two options will benefit the greatest number of people?

The next step was to develop a framework for the formation of policy guidelines, taking into account comments received from citizen input pursuant to Issues and Options. The framework developed was broken into four primary areas. These corresponded to the two broad areas of in-state use and development of additional energy resources. These primary areas are:

- Title I Policy Guidelines Related to Development and Management
- Title II Policy Guidelines Related to Disposition of State Royalties
- Title III Policy Guidelines Related to Energy Conservation

Title IV Policy Guidelines Related to Planning for
In-State Power Development and Use

Title I and II deal primarily with developing energy resources. Policies reflect positions concerning leasing, regulation and use of royalties. However, pursuant to these development-orientated policies there is recognition of the need for development of renewable resources and protection of the environment. Titles III and IV deal with in-state energy needs and planning. The emphasis in these sections is that of encouraging energy conservation, and the development of renewable energy resources for in-state demand.

With a framework developed, the Committee formulated policies in each of these areas. The policies were adopted and approved at a public meeting in Anchorage on November 29, 1978. After adoption of policies staff made recommendations to the Committee on suggested methods to implement the policies. These were in the form of suggested legislation and proposed studies. The implementation measures were presented and adopted in a Juneau meeting on December 6, 1978. Notes of these meetings are included in the appendix.

SECTION III EXECUTIVE SUMMARY

Below is a brief statement on the policies and proposals which

were recommended by the State Energy Policy Committee:

Title I: Policy Guidelines Related to Development
 and Management

1. "to distribute the risk of development between
 the State of Alaska and developers of energy resources"

* The Committee proposed that the state study the cost vs. benefits
of contracting for exploratory drilling for oil and gas, and of
obtaining the necessary geological and geophysical data.

2. "to encourage the development of economically viable
 renewable energy resources for in-state use"

* Allow the expensing of intangible drilling expenses and cost
depletion for geothermal wells. This was recently allowed by
Congress in the Energy Tax Act - 1978, part of the National
Energy Plan.

3. "to insure the orderly and timely development
 of energy resources, taking into consideration resource
 marketability"

* Consider enacting a uranium leasing law. Currently uranium
is not leased, but treated as a locatable mineral.

4. "to insure a fair return to the people of the state for conveyance of state owned energy resources"

* Consider increasing coal royalties. Currently royalties for coal may not be less than 5 cents a ton. See AS 38.05.150.

5. "to protect the environment when this is consistent with other provisions of the State Energy Policy"

* The Committee urges that the state oversee implementation of coal mining regulations under the Federal Surface Mining Control and Reclamation Act 1977, to assure that mining be allowed to continue in an environmentally acceptable way.

* The Committee also suggested that appropriate state agencies be responsible for preparation of social, environmental and economic analysis for energy projects which "significantly affect the human environment." This requirement would not apply to any energy project which would have a similar document prepared pursuant to another local, state or federal law.

Title II Policy Guidelines Related to Disposition
 of State Royalties

The Committee reviewed and adopted the Royalty Oil and Gas

Advisory Board's policy guidelines with some minor amendments. No recommendations were made by the Committee as to how to implement these policies. The policies were:

1. "maximize net benefits; these benefits include but are not limited to price, employment, local training, local hire and ownership, tax base and includes other economic, social and environmental ramifications"
2. "the baseline price for any royalty sale shall not be less than the price that would be received for that royalty if taken "in-value"
3. "to give preference first to existing in-state facilities, second to those expanding existing in-state facilities and third to those who will construct new in-state facilities"
4. "to withhold a portion of any royalties from long-term commitment to supply anticipated demands"
5. "with the exception of small sales to public utilities, sales will be for specified volumes of proportions or production, constant throughout the year, rather than for flexible volume options to be called for by the purchaser"

6. "products derived from royalties refined or processed in-state and subsequently used in-state will be priced at the lowest possible price"

7. "royalties or products from royalties exported from the state must be surplus to anticipated in-state needs for those royalties of products"

8. "in general royalties will be disposed of in long-term contracts rather than in "piece lots" as may be done by a private sector, trader or dealer"

Title III Policy Guidelines Related to Energy Conservation and Suggestion for Implementation

1. "to encourage and facilitate the implementation of energy conservation measures, for all in-state energy uses"

* The Committee chose to evaluate the fiscal impact of replacing AS 43.30.039 the Residential Conservation Credit with the Residential Energy Credit sections of the Energy Tax Act - 1978, recently passed by Congress. The Federal Energy Tax Credit is more generous than the current state tax credit and has a broader allowable application.

* The Committee also recommended expanding the authority of the Alternative Power Resource Revolving Loan Fund AS. 45.88.010 to allow loans for energy conservation improvements. The fund currently only has the authority to loan for alternate energy power projects.

2. "to maximize, when possible, federal monies and other resources available for energy conservation improvements"

* Consider supplementing federal weatherization programs with state money if needed. In the past, problems have arisen because of spending guidelines laid out for use of federal weatherization grant money.

* Establish a fund which provides state matching money for research and development projects supported in part by federal government grants or any other money available.

3. "to provide for the implementation of appropriate regional lighting and thermal efficiency standards in newly constructed residential and commercial buildings, and for retrofitting of existing buildings, while maintaining local autonomy"

* The Committee recommended adoption of appropriate lighting and

thermal efficiency standards in compliance with federal law.

4. "to encourage the structuring of energy utility rates which promote energy conservation"

* The Committee recommended to comply with appropriate provisions of "Public Utility Regulatory Policies Act of 1978", part of the recently enacted National Energy Legislation. This Federal Act requires consideration of alternative rate designs by regulatory agencies for larger utilities.

5. "to encourage the optimal use of exhaust heat"

* The Committee elected to require the efficient utilization of waste heat by any major industrial facility as a condition of using state royalties for fuel.

Title IV: Policy Guidelines Related to Planning for
 In-state Power Development and Use

1. "to assure for coordination of state and federal responsibility in planning for in-state energy needs and the development"

* The Committee recommended amending AS 44.56.224, "Long Term

Plan," to require the Division of Energy and Power Development to give equal consideration to all types of power generation which are economically feasible. This plan must be developed in conjunction with the Alaska Power Authority and must be approved by the Governor and submitted to the Legislature.

2. "encourage the availability of energy to all people of the state at the lowest possible rates consistent with good management techniques"

* The Committee, pursuant to a recommendation by a liaison group to the Energy Policy Committee chaired by Rep. Leo Rhode, recommended to use the Reserve for Energy Development Account to provide bonding leverage for small hydroelectric projects. (See attached subcommittee report).

SECTION IV PROPOSED POLICY GUIDELINES AND THEIR APPLICATION

This section reviews the proposed guidelines, the amendments and deletions to the guidelines and provides comments on their implications. The guidelines on Title I, III and IV were reviewed in Anchorage at the November 29 meeting. The guidelines for Title II were reviewed in Juneau at the December 6 meeting.

Title I. Policy Guidelines Related to the Development and Management of Alaska's Energy Resources

1. "to reduce the risk of development of oil and gas resources"

This policy was adopted by the Committee but amended to read;

"to distribute the risk of development between the State of Alaska and developers of energy resources"

The original policy guideline was intended to deal primarily with oil and gas leasing policy. The amendment adopted by the Committee expands the policy's application to include all types of energy resources. The discussion, however, will deal with only oil and gas.

There are four major sources of risk involved for a firm in leasing oil and gas land. These are: (1) the amount of recoverable resource located in the tract; (2) the cost of exploration; (3) the cost of developing the tract; (4) the future price of the resource. Under the traditional cash bonus fixed royalty bid the lessor shares in little or none of these four risks. The cash bonus is paid to the lessor prior to development of the tract. The bonus represents a sunk cost to the lessee and is paid to the lessor whether the tract is productive or not. This represents a relatively risk free situation for the lessor.

The State of Alaska, as a lessor, has taken steps which reflect

the policy of sharing the risk of development of oil and gas resources. The vehicle for this shift in policy was HB 854, "An Act relating to the leasing and exploration of state land for oil and gas development." (See AS 38.05.180). This Act, among other things, increases the number of bidding options available to the Commissioner for leasing oil and gas lands. With passage of HB 854, the Commissioner has basically three options: (1) cash bonus fixed royalty; (2) fixed bonus royalty bid; (3) fixed bonus percent of net profits.

Cash Bonus Fixed Royalty

Of the three bidding methods, the cash bonus fixed royalty option represents the least risk to the lessor. When a lease tract is offered, a firm will calculate a bonus based on its expected present value of the resource. In calculating a bonus a firm includes many subjective elements. Risk averse firms will tend to discount the bonus offered because of the high level of uncertainty over the lease tract's potential. The high levels of uncertainty may also increase the cost of capital over what might be required for more secure investments. Both of these factors tend to decrease the expected present value of the resource and will be reflected in lower bonus bids. The bonus is basically a residual; that is, the bonus is what is left over after subtracting developmental costs and an expected rate of return from the expected present value of the resource.

There are several advantages to the cash bonus method of bidding. Indeed some may argue that a "no risk" situation may in itself be considered an advantage. Other advantages include:

- (1) The bonus represents a large commitment by the lessee.
- (2) There are no disincentives placed on marginal production other than the fixed royalty which may be reduced by the Commissioner if this extends the productive life of the field.
- (3) The state receives its money up front.*
- (4) Major corporations have access to market funds at low interest rates, and this will normally be reflected in higher bonuses.
- (5) Bonus bidding requires minimal state regulation and policing.
- (6) The state may make up revenues from low bonuses on productive acreage by increasing the severance tax.

For its simplicity, cash bonus bidding has problems associated with it. The bonus represents a high capital barrier to entry for smaller firms. This may lead to less competition in the bidding process and tend to depress the bonus below the true expected present value. Disadvantages of the bonus system are:

*Note: This may or may not be an advantage depending on the state's financial condition.

(1) A high capital barrier to entry. Because of the high up front costs of the bonus, small firms are at a disadvantage because of the difficulty of raising the necessary money. This may tend to reduce competition.

(2) The payment of cash bonus is made at the same time that capital must be secured for exploratory drilling. This further exacerbates the money crunch for smaller firms.

(3) It is questionable whether the state is in need of large amounts of front money at a time when they are looking for outlets for the Permanent Fund.

(4) Selling land under the bonus system is tantamount to the state divesting itself of planning and resource management responsibility. The state applies the rule of caveat emptor as there is a high degree of uncertainty as to the real potential of the lease tracts.

(5) As low as the industry's internal costs of capital may be, the state's effective rate is probably lower. This presents a conflict between the state and companies over the time value preference of money. This may result in a misallocation of the resource in terms of production, and may correspondingly result in lower bonuses offered by companies.

Many of these points were raised in a report to the Legislature