

SCOMM

#44:21

STATUS REPORT

HOUSE POWER ALTERNATIVES STUDY COMMITTEE

ALASKA STATE LEGISLATURE

JANUARY 30, 1980

The House Power Alternative Study Committee was established by the Legislative Council in August 1979 to supervise the \$200,000. appropriation contained in Chapter 76, SLA 1979. The legislation mandates completion of a study which discusses the assumptions of the Sustina Hydroelectric Project and the feasibility of alternatives for power generation such as coal, natural gas and small hydro. The appropriation was originally directed to the Legislative Research Division. Because several months of time were lost due to the agency's demise, the study has been somewhat restructured to best meet the requirements of the legislation. We have attempted to plan our work to coordinate with that of the Alaska Power Authority as proposed in the fall of 1979.

The Committee had been guided by the belief that a project of the magnitude of Sustina deserves thoughtful, objective review. The State of Alaska has never before attempted public works planning or construction on this scale. Although we recognize that hydroelectric power is generally superior to fossil-fuel generated forms, Sustina's huge capital costs point out the need for scrutiny from those not intimately involved with the project's construction. The question is not only if Sustina will be built, but at what pace and size once the decision to proceed is made.

There are several areas that interested parties have pointed to as deserving greater attention. Although the Committee's concerns have

focused on the economics of the project, we will mention some of the other problem areas. The next few paragraphs highlight these gaps in present knowledge.

Power market demand analyses which include current data, and use state of the art analytic techniques, have not yet been performed. The estimate of future power market demand is vital to the project, since the cost of the dam can only be repaid by selling the generated power. If the demand for electric power is less than the capacity of the dam, either consumers will have to pay inordinately high charges for the use of electricity, or the state will have to bail out the largest public works project ever attempted in Alaska.

The uncertainty of the existing demand projections is compounded by the uncertainty of the cost estimates for the project. Sustina will be one of the largest hydroelectric projects ever attempted in a sub-arctic region, and will be constructed in an active seismic area. These engineering problems, which may be solvable with proper effort and money, take on a special significance when one considers the effect of cost overruns. Preliminary economic analysis have shown the project to be the lowest-cost alternative for power generation in the run if cost overruns are modest. Prior experience with large-scale sub-arctic construction is limited, but the conclusions that can be drawn from it are unsettling.

Previous studies that have evaluated the costs and benefits of alternative means of generating power in the Railbelt area have been conducted with less than total rigor. Questions of discounting, cost

overruns, backup capacity and financing costs have been treated critically, if at all. This previous work, by the Batelle Institute and the Alaska Power Administration, did fulfill its assigned task--pointing out the best alternative for more detailed study. The Phase I feasibility study that will provide the foundation for the decision to build the project must contain a fully rigorous cost-benefit analysis.

The legislative and executive branches of government have only begun to consider possible financing options. Should those who will benefit from the project, or the entire state, be required to pay for it? Perhaps the cheapest method of financing would be general obligation bonds, approved by the voters, backed by the full faith and credit of the state. The state can earn a return on surplus cash that is greater than our cost of borrowing in such a situation. If the costs of the project are met from the general fund, and repaid into the general fund as the power is sold, the citizens of the state will be foregoing use of the cash while paying more for the project in the long run - without being required to approve such a plan. In either case, the costs of the project would be subsidized by the entire state for the benefit of Railbelt consumers of electricity.

If the project were financed with revenue bonds, to be repaid from the sale of Sustina power, the market would fix the real costs of the project by evaluating the likelihood of repayment. The greater the confidence with which the market views the projects chance of success, the lower the interest rate on the revenue bonds. A gua-

rantee of such debt would distort borrowing costs. Again, such a guarantee (similar in concept to a general obligation bond) would amount to a statewide subsidy for the project, without the benefits of a direct vote. The question of such subsidy, which normally would seem unfair when only one region is receiving direct benefits, is complicated because approximately two-thirds of the state's population lives in the area that would receive power from the project.

The alternative sources of power for the Railbelt area have not been adequately explored. Sustina appears to be the best option; however, thorough analyses of the potential of natural gas, small-scale renewable energy sources and conservation/efficiency efforts have not been done. All of the alternatives to Sustina could potentially provide electricity to Railbelt consumers at a much lower cost than the dam. Until they have been given proper attention by independent specialists, their potential should not be dismissed.

Other concerns exist because of the dam's location on a stream that generates a large portion of one of the most valuable fisheries in the state. Although the dam will be built beyond the tributaries where salmon spawn, changes in stream flow levels, siltation and temperature will effect the salmon runs. Again, adequate studies need to be performed before a decision on the Sustina project is reached. No comprehensive study program of the Sustina River fisheries has been started, although construction of the project has been contemplated since statehood.

The placement of the dams in an active seismic area is another reason for caution. The stresses that result from filling large reservoirs have been known to trigger earthquakes, and such earthquakes could result in destructive flooding and loss of life. If the state is to attempt this project, it must do so in full understanding of the seismic risks and attendant design costs.

Since taking full control of the project this past fall, the Alaska Power Authority has begun the process of designing a Phase I Plan of Study that will fully evaluate the problem areas expressed above. The Committee's work has been designed to guide and support their efforts, to ensure the wisest planning and decision-making. The Committee is fortunate to have an excellent working relationship with the Power Authority. We have coordinated our study with the Authority as much as possible to prevent duplication of effort while providing criticisms of their work at the most useful times.

Briefly, the Committee has work in progress, or plans to complete work in the following areas:

1. Power Market Demand
2. Potential for Conservation and Alternative Energy Sources
3. Potential of Natural Gas
4. Criteria for Evaluation of Project Benefits and Costs
5. An Overview of the Policy, Management and Financing Issues Central to the Sustina Project.
6. General Tracking of Phase I Study Progress

A detailed description of the Committee's work to date follows.

1. Power Market Demand Projections

This section of the study is being performed by the University of Alaska's Institute for Social and Economic Research. The Alaska Power Authority has participated in the design and funding of this analysis, and will use the results of ISER's work for the power market demand section of the Sustina Phase I study.

The ISER study will include a methodological review, data collection and updating, economic projections, assessment of interfuel substitution possibilities, electricity use projections and an assessment of the probabilities of the various scenarios and projections. The Institute is using a combination of econometric modeling and end use forecasting, the first time that this approach has been used in Alaska. This new (to Alaska) approach by ISER provides a more accurate method of forecasting demand in a time of volatile energy prices.

The Committee has retained Energy Probe of Canada to work with ISER in evaluating the suitability of their modeling, and to provide the Committee with an evaluation of ISER's work. A draft report by Energy Probe is available at this time. The Committee has also retained Brad Tuck, an economist at the University of Alaska School of Business, to provide an assessment of the ISER work.

2. Potential of Conservation and Renewable Energy

This section of the study will evaluate the portion of power

demand that might be met by improved conservation, or efficiency in energy use, and the use of small-scale, alternative energy sources. The Alaska Center for Policy Studies is managing this section of the study, which also includes an analysis of the end uses of energy in the Railbelt area. Various portions of this section are being performed by Mark Fryer and Assoc., The Federation for Community Self-Reliance, the Alaska Public Interest Research Group and Richard Seifert.

### 3. Natural Gas

This section of the study is being done under the direction of economist Gregg Erickson. It will address the institutional limitations on the future use of natural gas for power generation, the future price and availability of natural gas, the efficiency of gas fired generations facilities and the potential for the use of natural gas in direct consumer applications.

### 4. Overview

Arlon Tussing and Assoc. has provided, as background document, a review of Alaska electric utilities and the regulatory framework in which they operate, with a brief history of the Sustina Hydroelectric Project. Tussing and Assoc. are also preparing a report for the Committee that will review the major policy issues of the Sustina project, and discuss the management and financing of electric power projects in Alaska.

## 5. Additional Study Work

Larry Katkin, of Dynamic Research, completed an assessment of the geotechnical aspects of the Phase I Study plan. The Committee plans to have an economist prepare a short paper detailing methodology for the assessment of the various power alternatives, socio-cultural impacts and fisheries studies.

## 6. Related Legislation

The Committee, in cooperation with House Resources, has designed a comprehensive energy conservation bill. The bill covers state government facility energy use, utility policy, and provides various mandates and incentives for increased energy efficiency in the residential, commercial and industrial sectors. The legislation, entitled, "An Act Establishing A State <sup>Energy</sup> Conservation Policy", will be introduced by the first week of February. The Committee has actively participated in the design of the House of Representatives "energy package".

House Bill 570 was introduced, and appropriates 7.5 million dollars to the Power Authority for fiscal year 1981, at which time the Authority expects to be ready to make a go/no go decision on the project. The bill also includes 90,000. dollars for continued legislative oversight of the Phase I study. The evaluation of power alternatives will be the primary focus of the oversight. It cannot be performed until later this year, when the Authority will be reviewing all of the available alternatives in detail as part of the FERC

licensing procedure. An appropriation for University of Alaska geophysical work in the Sustina River basin is also contained in HB 570. The program would provide experience for University geology students that would aid them in efforts to participate in Phase II of the Sustina effort.

7. Participation in the Alaska Power Authority's Selection of a Private Firm to Carry Out the Phase I Plan of Study

The Committee analyzed the three voluminous proposals submitted to the Authority by Acres American, International Engineering and Harza. Katkin, a geotechnical consultant, was retained by the Committee to review the quality of the geotechnical aspects of the proposals. The Committee focused on the sections of the study dealing with power market demand projections, power alternatives, environmental impacts and public participation.

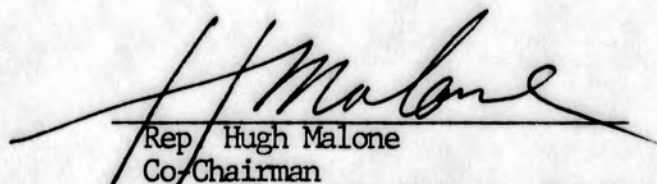
Rep. Rogers presented detailed testimony to the board of the Authority. The testimony strongly supported the choice of Acres American for several reasons:

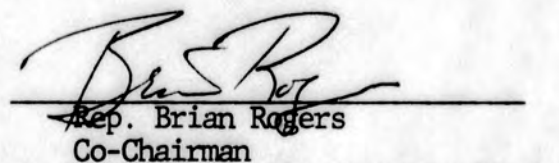
1. Acres possessed the greatest experience with sub-arctic construction and planned to retain the most experienced firm in Alaska for geotechnical work.
2. Acres planned to spend a greater portion of the budget in-state than any of the firms.
3. The Acres proposal contained the most objective and detailed studies of power market demand and power alternatives.
4. The Acres proposal provided for the most extensive and direct public participation process.
5. The Acres proposal provided for the most expert, objective check on the quality of seismic work.

Concurring with the Committee analysis and other testimony, the A.P.A. chose Acres to be the firm to carry out the Plan of Study.

There are over a score of state agencies and legislative committees investigating related energy questions. We have tried to keep everyone apprised of our work, and in turn have enjoyed the benefits of their comments, as well as questions and suggestions from the public. A draft of Power Alternatives Study will be submitted to the legislature on April 15, 1980. A final report will not be available until May, because the power market demand work by ISER cannot be completed until then. A detailed breakdown of our budget is attached.

Any member of the legislature or public is welcome to contact the Committee for further information or copies of available reports. Inquires should be directed to Mark Wittow, Study Coordinator, c/o Rep. Malone, Pouch V, Juneau, Alaska 99811. The phone is 907-465-3711/3799.

  
Rep. Hugh Malone  
Co-Chairman  
House Power Alternatives Study  
Committee

  
Rep. Brian Rogers  
Co-Chairman  
House Power Alternatives Study  
Committee

House Power Alternatives Study Committee

Budget Breakdown

January 30, 1980

Total Budget -- \$200,000. Detailed information on each of these contracts is contained in the preceding status report.

Contractual:

Larry Katkin, Dynamic Research Corp. Geotechnical Analysis (report available)	\$1100.
University of Alaska Institute for Social and Economic Research. Power Market Demand Forecast (detailed work plan available)	30,000. + (30,000 from the APA)
Alaska Center for Policy Studies. Potential for Conservation and Renewable Energy Use (detailed work plan available)	68,500.
Gregg Erickson. Natural Gas Potential	20,000.
Arlon Tussing and Assoc. Policy, Management and Financing Issues	17,500.
Energy Probe. Demand Analysis Review (preliminary report available)	10,000.
Brad Tuck. Demand Analysis Review	6,000.
Sim Van der Ryn. Study Design	2,000.
<u>Personal Services</u>	
Mark Wittow. Study Coordinator (at standard A.A. rate)	10,500.
<u>Travel</u>	7,500. (reserved)

The uncommitted portion of the study funding will be used for work on coal potential and criteria for evaluation of costs and benefits.

House Power Alternatives Study Committee

Budget Breakdown

January 30, 1980

Total Budget -- \$200,000. Detailed information on each of these contracts is contained in the preceding status report.

Contractual:

Larry Katkin, Dynamic Research Corp. Geotechnical Analysis (report available)	\$1100.
University of Alaska Institute for Social and Economic Research. Power Market Demand Forecast (detailed work plan available)	30,000. + (30,000 from the APA)
Alaska Center for Policy Studies. Potential for Conservation and Renewable Energy Use (detailed work plan available)	68,500.
Gregg Erickson. Natural Gas Potential	20,000.
Arlon Tussing and Assoc. Policy, Management and Financing Issues	17,500.
Energy Probe. Demand Analysis Review (preliminary report available)	10,000.
Brad Tuck. Demand Analysis Review	6,000.
Sim Van der Ryn. Study Design	2,000.
<u>Personal Services</u>	
Mark Wittow. Study Coordinator (at standard A.A. rate)	10,500.
<u>Travel</u>	7,500. (reserved)

The uncommitted portion of the study funding will be used for work on coal potential and criteria for evaluation of costs and benefits.

Pouch V  
Juneau, Alaska 99811

Rep. Terry Gardiner  
Speaker of the House  
Pouch V  
Juneau, Alaska 99811

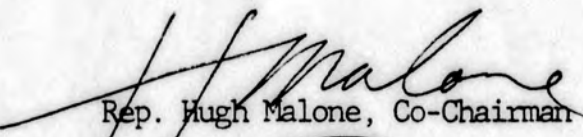
April 15, 1980


Dear Terry:

Chapter 76 of SLA 1979 mandated the completion of a study which discussed the assumptions of the Susitna Hydroelectric Project and the feasibility of various alternatives for power generation in the Railbelt such as coal, natural gas and small hydro. The appropriation was directed to the Legislative Research Division; a report was to be submitted by April 15, 1980.

As you know, the Legislative Research Division was dissolved shortly after Chapter 76 was enacted. The House Power Alternatives Study Committee was established by the Legislative Council in August 1979 to oversee the study. We offer the following report to satisfy the April 15 deadline set out in Chapter 76. A final report will be available by May 20, 1980.

Sincerely,

  
Rep. Hugh Malone, Co-Chairman

  
Rep. Brian Rogers, Co-Chairman

Attachments:

1. Power Market Demand Study (by ISER, draft)
2. Review of Demand Forecasting (Tuck, draft)
3. Comentary on ISER work (Energy Probe, draft)
4. End Uses of Energy in the Railbelt (Ak. Center for Policy Studies)
5. Potential for Energy Conservation in the Railbelt (Center)
6. Alternative Energy Potential (Fryer and Assoc.)
7. Susitna Geotechnical Evalution (Dynamic Research)
8. January 30, 1980 Status Report

9. Background and History - Susitna and Railbelt Power (Tussing and Assoc.)
10. Solar Energy Potential (Center)

To be completed:

1. Analysis of Management, Policy and Financial Issues for Railbelt Power Generation (Tussing and Assoc.)
2. Potential of Natural Gas for Power Generation (G. Erickson)
3. Potential of Coal for Power Generation (G. Erickson)
4. Policy and Management Issues for Energy Conservation and Alternative Energy (Center)