Community Meeting Public Input for the Railbelt Electric Power Alternatives Study

Volume X

September 1982

**Prepared for the Office of the Governor
State of Alaska
Division of Policy Development and Planning
and the Governor's Policy Review Committee
under Contract 2311204417**

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COMMUNITY MEETING PUBLIC INPUT FOR THE RAILBELT ELECTRIC POWER ALTERNATIVES STUDY

Volume X

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SUMMARY

The participation of the Alaskan public is an important part of the Railbelt Electric Power Alternatives Study. As part of the public participation program, a series of community meetings was held in May 1981, the results of which will be used in developing long-range plans for Railbelt electric energy generation. In addition to presenting information about the study, these meetings also sought information on the attendees' attitudes toward electric power development in the Railbelt. To this end, a question and answer session was held and an opinion survey was administered. This report presents the results of the opinion survey activity.

The objective of the opinion survey was to obtain an indication of the attendees' attitudes on four aspects of the preliminary Railbelt electric energy plans: 1) the planning objectives to serve as a framework for developing the energy plans; 2) the issues associated with the selection of the alternative technologies; 3) the energy resources available for possible electric energy generation in the Railbelt; and 4) possible state incentive programs to promote various electric power alternatives.

Sixty-two individuals attending the Anchorage, Fairbanks, Talkeetna and Soldatna meetings completed the opinion surveys. The survey respondents indicated, on the average, a strong desire that alternative energy resources and environmental concerns should be given a high priority in the development of plans for meeting future Railbelt electric needs. This concern for the environment was again evident in the relatively high scores the respondents assigned to the environmental issues associated with the selection of electric power technologies. Based on the average number of points that were assigned to the ten major technology selection issues, a preference analysis exercise was performed. The results indicated a potentially strong preference for the development of conservation and small-scale solar and wind systems for the Railbelt. In the third portion of the survey, the respondents agreed strongly that conservation and hydro energy resources should be emphasized when meeting the Railbelt's electric needs. Nuclear power was generally felt to not be appropriate for the Railbelt.

In the final portion of the survey, the respondents indicated a relatively strong preference that the state should promote conservation by the use of incentive programs. They felt, to a somewhat lesser degree, that small-scale renewable alternatives and large-scale renewable alternatives should also be promoted with state incentive programs. The results from a set of 34 surveys distributed and mailed in subsequent to the meetings generally coincided with those of the meeting respondents.

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1.0 INTRODUCTION

The Railbelt Electric Power Alternatives Study was mandated by the Alaskan State Legislature to examine potential strategies for future electric development in the Railbelt region. To achieve this objective, several alternative long-range (1982-2010) plans for future electric power development in the Railbelt region are being identified and investigated by Battelle Pacific Northwest Laboratories for the State of Alaska. The results of this investigation will be used by the Office of Governor to formulate recommendations to the Legislature for power development in the Railbelt.

The long-range plans for electric energy production consist of various combinations or sets of electric generation alternatives to meet peak demand. The specific electric generation technologies comprising these sets will be selected based on their potential for achieving certain energy planning objectives Alaskans may wish to pursue. Such objectives might include maximizing in-state investments, maximizing the use of renewable energy resources, and minimizing the cost of electrical power. These plans will be based on the consideration of five factors: 1) the availability of natural resources for the production of electricity; 2) the current generating facilities and systems and the scheduled plans for developing new generation capacity, transmission interconnections, and load management and conservation programs; 3) the performance and availability of the alternative technologies being considered; 4) forecasts of electric energy needs; and 5) the environmental, and socioeconomic effects of the plan.

The attitudes and desires of the Alaskan public will play an important role in developing and assessing these plans. In order to provide the public with information about the study and an opportunity to express their views and concerns, a public participation program was set up. As part of this public participation program a series of public meetings was held in May 1981, the results of which will be used in developing the plans. One portion of the public meetings was devoted to completing an opinion survey. The results of the opinion survey are presented in this report.

The public participation program is described in Chapter 2. The following four sections are devoted to the results of the opinion survey. Chapter 3 presents the respondents' views on the study's planning objectives. Their concerns related to various issues associated with the selection of electric power alternatives are ranked in Chapter 4. Chapter 4 also analyzes the implications of these rankings on the public's potential preferences for various alternative conservation and supply technologies. The results of questions concerning future use of various energy resources and state incentives for power development are reviewed in Chapters 5 and 6, respectively.

The results from the surveys submitted subsequent to the community meetings are presented in Appendix A. Appendix B lists the 53 Railbelt organizations contacted to attend the April workshops and to provide input to the study effort. Appendices C, D, and E, respectively, examine the methodology, performance indices, and estimates of alternative technologies used in the public preference analysis effort. A list of the written comments received from the survey respondents is presented in Appendix F.

2.0 THE PUBLIC PARTICIPATION PROGRAM

There has been an increasing interest and desire on the part of the public to have a say in the decisions that will affect their future. In order to provide Alaskans the opportunity to become involved in the study's decision activities of the Railbelt Electric Power Alternatives Study, a public participation program was created.

The public participation program was designed to disseminate information about the study to the public and to obtain the views and concerns of interested citizens. Throughout the project, information has been made available to interested individuals and organizations through workshops, community meetings, newsletters and project reports. The public is given the opportunity at all workshops and community meetings to express their views and concerns on any aspect of the study. The public is also requested to communicate their questions, views, and requests to Battelle at any time during the study's period. The study's public participation facilitator located in Anchorage, has been designated as the public information contact. The facilitator is able to supply any requested study documents to the public and transmits questions or comments to the study team. Specific public participation program activities are as follows:

- Workshop Sessions
  Representatives of 53 organizations interested in the study were invited to workshops held in April 1981 in Anchorage and Fairbanks. Information concerning the study was presented and comments were received on the demand forecasting methodology, the proposed candidate alternatives and the proposed public opinion survey.

- Community Meetings
  Community meetings were held in May 1981 in Talkeetna, Anchorage, Fairbanks and Soldatna. The purpose of these meetings was to provide interested citizens with an overview of the study and to obtain their comments and opinions on the technology selection issues (the issues associated with the selection of electric power alternatives for the Railbelt). An opinion survey was administered.

- Mid-Project Review Community Meetings

  Mid-project reviews were conducted in September 1981 in Anchorage and Fairbanks. The agenda of the mid-project reviews included a review of electric power alternatives selected for further consideration and a presentation of the preliminary Railbelt Electric Energy Plans.

- Final Project Review Community Meetings

  Final project reviews are scheduled for February or March 1982 in Anchorage, Talkeetna, Fairbanks, and Soldatna. The findings of the Railbelt Electric Power Alternatives study will be discussed at these meetings.

- Legislative Briefings

  A Legislative briefing was held in May 1981 in Juneau and a second briefing is scheduled for January or February 1982 in Juneau. The briefings are designed to provide the Legislature with information about the study, review preliminary and final findings and obtain comment from the representatives, their staffs, and interested citizens.

- Newsletters

  Periodic newsletters are produced to explain the activities and purpose of the study, review interim findings and discuss the final results of the study. The newsletters, available at all community meetings, will be distributed to all individuals requesting them. The four newsletters are scheduled as follows:

  March 1981
  August 1981
  November 1981
  February-March 1982

- Library Reference Reports

  Several reports produced by the Railbelt Electric Power Alternatives Study are distributed to the libraries in the Railbelt region. They are available at the reference desk for public review. These reports are also placed in the Alaska State Library in Juneau.

As summarized above, a series of community meetings was held on May 18-22, 1981 in Talkeetna, Anchorage, Fairbanks, and Soldatna. The purpose, structure and schedule of the study was explained at these meetings. The forecasting methodology for electric demand projections was presented. The set of candidate electric power supply and conservation alternatives being considered for inclusion in the power development plans was also described.

In addition to presenting information on the Railbelt Electric Power Alternatives Study, these meetings also sought to solicit information on the public's attitudes toward electric power development in the Railbelt. To this end, a question-and-answer session was held following each presentation and an opinion survey was administered. The objective of the opinion survey was to obtain an indication of the attendees' attitudes on four aspects of the preliminary Railbelt electric energy plans: 1) The planning objectives to serve as a framework for developing the energy plans; 2) the issues associated with the selection of the alternative technologies, 3) the energy resources available for possible electric generation in the Railbelt; and 4) possible state incentive programs designed to promote various electric power alternatives. The results of this survey, presented in the following sections, were taken into consideration, along with oral and written comments received during and subsequent to the meetings, in developing the Railbelt electric energy plans.

The attendance at the meetings was somewhat lower than anticipated. There were 10 people in attendance at the Talkeetna, 42 at the Anchorage meeting, and 9 at the Fairbanks meeting. In Soldatna only one individual turned out for the community meeting.

3.0 PLANNING OBJECTIVES - OPINION SURVEY RESULTS

The first part of the four-part opinion survey addressed the objectives of electric power system planning. A list of fourteen objectives was developed, representing the major concerns Alaskans have been expressing with respect to future Railbelt electric power systems. This section was intended to provide an indication of the attendees' attitudes on the direction of future Railbelt electric planning efforts.

Initially, we intended the survey to be administered only to individuals at the four community meetings. But at the Talkeetna and Fairbanks meetings, several attendees requested additional copies to distribute within their communities. Copies were made available and as a result a number of surveys were mailed to us subsequent to the meetings. Because the individuals attending the meetings received an introductory presentation for each part of the survey and the mail-in respondents did not, the two groups were reviewed separately for the purposes of this report. The "mail-in" survey results are presented in Appendix A.

The respondents were requested to indicate the degree to which they agreed or disagreed with 12 questions dealing with (fourteen planning objectives (one question consisted of three parts). The results are shown in Table 1. The respondents had the option of checking one of six boxes that best represented their views. These were: strongly agree, agree, indifferent, disagree, strongly disagree, or no opinion. The responses were scored based on the assignment of two points for strongly agree, one for agree, zero for indifferent, minus one for disagree and minus two for strongly disagree. The average score of the response of the 62 respondents to each question is shown in Table 1. Thus, average scores approaching 2 indicate strong agreement; average scores approaching -2 indicate strong disagreement. As seen in the table, there is a marked preference for renewable energy sources and for the preservation of the environment. Most respondents indicated a general disagreement with the statement that Railbelt electric power system development should be structured to encourage large-scale industrial growth, create jobs, or to minimize the risk of future inflation in electric power costs.

TABLE 1. Average Scores and Rankings Meeting Attendees Assigned to Railbelt Electric Planning Objectives

Statement	Average Score[a]	Rank Order
Alternatives using renewable energy resources (wind, tidal, solar, hydro, geothermal, wood waste and refuse) should be given preference over alternatives not using renewable resources	1.4	1
The protection of fish and wildlife resources should be the primary objective when meeting Railbelt electric power needs	1.3	2
The protection of the following Alaskan environments should be the primary objective when meeting Railbelt electric power needs:		
a) Forest, meadow, muskeg and tundra	1.0	6
b) Streams, lakes and rivers,	1.7	3
c) Saltwater and coastline	1.3	4
Maintenance or improvement of air quality should be the primary objective when meeting Railbelt electric power needs	1.2	5
Increasing the reliability of the electric service should be the primary objective when meeting Railbet electric power needs	0.8	7
Conservation alternatives should be given preference over electric generating alternatives	0.7	8
Minimizing the cost of power should be the primary objective when meeting Railbelt electric power needs	0.6	9
Electric power development should be based on local, small-scale generating alternatives	0.3	10
The retention of dollars within Alaska spent on construction, operation and maintenance should be the primary objective when meeting Railbelt electric power needs	0.2	11
Minimizing the risk of future inflation in electric power costs should be the primary objective when meeting Railbelt electric power needs	-0.4	12
Creation of jobs should be the primary objective when meeting Railbelt electric needs	-0.8	13
Encouragement of large-scale industrial growth should be the primary objective when meeting Railbelt electric power needs	-1.0	14

(a) The average score was based on the number of individuals expressing an opinion on the following scale: strongly agree = 2, agree = 1, indifferent = 0, disagree = -1, strongly disagree = -2

Development-oriented and conservation-oriented individuals tend to hold potentially very different values. In an attempt to identify these differences, the responses of the many of meeting's participants have been divided into "development-oriented" and "conservation-oriented" categories. This was done based on the responses received to the planning objective statement, "Encouragement of large-scale industrial growth should be the primary objective when meeting Railbelt electric power needs". If they agreed or strongly agreed with this statement, then they were categorized as development-oriented. If they disagreed, or strongly disagreed, then they were placed in the conservation group. Of the 62 individuals at the meeting who completed the survey forms, 42 were categorized as conservation-oriented and nine as development-oriented.

The average scores assigned by conservation oriented and development oriented individuals are presented in Table 2. The conservation oriented group generally agreed that environment objectives should be of primary concern. The development-oriented group scores indicated a preference for planning objectives that minimize the cost of power, encourage large-scale industrial growth, and increase the reliability of electric service. The conservation-oriented group, by definition, did not agree that large-scale industrial growth should be encouraged. They also indicated that electric power development should not be designed to create jobs. The development-oriented individuals somewhat disagreed that, when meeting Railbelt electric planning objectives, local, small-scale generating alternatives should form the basis of electric power development, that conservation alternatives should be given preference, and that the protection of the forest, meadows, muskeg and tundra should be the primary objective.

TABLE 2. Average Scores Conservation-Oriented and Development-Oriented Respondents Assigned to Railbelt Electric Planning Objectives

Statement	Average Score[a] Conservation-Oriented Respondents	Development-Oriented Respondents
The protection of fish and wildlife resources should be the primary objective when meeting Railbelt electric power needs.	1.6	0.6
The protection of the following Alaskan environments should be the primary objective when meeting Railbelt electric power needs:		
a) Forest, meadow, muskeg and tundra,	1.1	-0.1
b) Streams, lakes and rivers,	1.5	0.4
c) Saltwater and coastline.	1.4	0.4
Alternatives using renewable energy resources (wind, tidal, solar, hydro, geothermal, wood waste and refuse) should be given preference over alternatives not using renewable resources	1.4	0.7
Maintenance or improvement of air quality should be the primary objective when meeting Railbelt electric power needs.	1.3	0.4
Conservation alternatives should be given preference over electric generating alternatives.	1.3	0.4
Electric power development should be based on local, small-scale generating alternatives.	0.8	-0.5
Minimizing the risk of future inflation in electric power costs should be the primary objective when meeting Railbelt electric power needs.	0.4	1.0
Increasing the reliability of the electric service should be the primary objective when meeting Railbelt electric power needs.	0.1	1.2
The retention of dollars within Alaska spent on construction, operation and maintenance should be the primary objective when meeting Railbelt electric power needs.	0	0.7
Minimizing the cost of power should be the primary objective when meeting Railbelt electric power needs.	0	1.5
Creation of jobs should be the primary objective when meeting Railbelt electric power needs.	-1.3	0.6
Encouragement of large-scale industrial growth should be the primary objective when meeting Railbelt electric power needs.	-1.7	1.4

(a) The average score was based on the number of individuals expressing an opinion on the following scale: strongly agree = 2, agree = 1, indifferent = 0, disagree = -1, strongly disagree = -2.

4.0 TECHNOLOGY SELECTION ISSUES

An important aspect of the selection of electric power alternatives for the Railbelt energy plans is the consideration of the public's potential preferences for various alternative technologies. Two sets of questions on the survey were designed to provide results that would assist in understanding the public's views concerning the candidate technologies. The first set, Section B, addressed the importance of various technologies selection issues. The second set, Section C, discussed in the next section, examined the emphasis that should be given to developing different energy resources.

In Section B the respondents were asked to indicate their level of concern with respect to 10 issues associated with the selection of electric power alternatives by distributing 100 points among the 10 issues. Issue considered to be relatively more important were to be assigned more points and those they felt were of less importance were to be given fewer points.

The 10 issues presented were considered to be the main factors of concern to Alaskans in the selection of future electric power alternatives. Initially a list was developed based on discussions with individuals who are involved in Railbelt electric power planning, reviews of public comments at past Railbelt community meetings (such as the Alaska Power Administration's Susitna Hydro community meetings and the Alaska Public Forum community meetings) and examinations of the issues addressed in previous Railbelt energy assessment studies. Copies of the list were sent to representatives of 53 organizations having a potential interest in the study for their review and comment. (These organizations are identified in Appendix B.) Copies were also presented at the April 1981 workshop sessions. The preliminary list was modified as a result of the comments received from these organizations and from an internal review effort. The final list of 10 issues was presented in Section B with the objective of identifying how important each issue is to the survey respondents. These issues and the average response scores are shown in Table 3.

TABLE 3. Average Relative Importance Assigned by Meeting Attendees to Electric Power Technology Selection Issues

Issues	Number of Points	Order
Protecting fish and wildlife resources	16.0	1
Minimizing energy costs	12.3	2
Protecting air quality	11.6	3
Protecting the scenic quality of the region	11.4	4
Avoiding potential catastrophic accidents	11.3	5
Avoiding long-term health effects	10.5	6
Promoting energy self-reliance	9.5	7
Avoiding "boom-bust" social impacts	8.4	8
Promoting in-state power-related employment	4.9	9
Reducing consumer effort	4.1	10

4.1 OPINION SURVEY RESULTS

As can be seen in Table 3, the individuals attending the community meetings generally felt that protecting the fish and wildlife resources of the region was the most important issue, assigning it 16.0 points. Of the next three highest ranked issues, two are oriented toward protecting the environment. These are, protecting air quality (11.6) and protecting the scenic quality of the region (11.4). Minimizing the cost of energy was assigned an average of 12.3 points, placing it second in the order of importance. Socioeconomic issues constituted the majority of the issues receiving the fewest average number of points. Promoting energy-self reliance (9.5), avoiding "boom-bust" social impacts (8.4) and promoting in-state power-related employment (4.9) were ranked seventh, eighth and ninth respectively. Only the issue of reducing consumer effort received fewer points (4.1).

One of the reasons for categorizing many of the meeting attendees responses as either conservation-oriented or development-oriented was to identify the possible range of viewpoints. Knowing this range would prove useful in understanding the survey responses. The responses to Section B by these two groups of individuals revealed a significant difference of opinion

concerning the importance of various electric power development issues. Table 4 presents the average number of points assigned to each issue by the two groups.

TABLE 4. Average Relative Levels of Importance Assigned by Conservation-Oriented and Development-Oriented Respondents to Electric Power Technology Selection Issues

Issues	Conservation Oriented Responses Average Number of Points	Development Oriented Responses Average Number of Points
Protecting fish and wildlife resources	17.9	7.2
Protecting air quality	12.6	6.6
Protecting the scenic quality of the region	12.4	7
Avoiding potential catastrophic accidents	11.9	8.3
Avoiding long-term health effects	11.3	6.8
Promoting energy self-reliance	9.6	9.2
Minimizing energy costs	8.9	28.1
Avoiding "boom-bust" social impacts	8.4	8.3
Reducing consumer effort	3.5	6.6
Promoting in-state power-related employment	3.4	11.6

The conservation-oriented individuals generally assigned the greatest number of points to the three environmental issues, protecting fish and wildlife (17.9), protecting air quality (12.6) and protecting the scenic quality (12.5). The public health and safety issues received the next highest number of points. As can be seen in Table 4, reducing consumer effort and

promoting in-state power related employment were rated significantly lower than the other issues, each receiving about 3.5 points.

The development-oriented responses produced quite different point assignments. The issue of minimizing the cost of energy was by far the most important issue to the group and was given an average of 28.1 points. In contrast the conservation group by comparison, assigned it 8.9 points, ranking it seventh. The development-oriented group considered the issue of promoting in-state power related employment to be second in importance (11.6 points). The conservation group gave it 3.5 points, placing it at the bottom of their list. As shown in Table 4, the other area of disagreement was with respect to the environmental issues. The development-oriented group rated them relatively low in importance, assigning them 4.5 to 20.6 points less than the conservation group. Both groups rated the issue of reducing consumer effort as of relatively low value.

The responses to Section B proved useful on two accounts. First, they assisted in identifying the degree of importance various interested individuals assign to electric power development issues. Second, the responses provided a basis for an analysis effort that would assist in identifying the public's potential preferences for different electric power alternatives. This analysis effort systematically combines the projected performance of each alternative on the 10 issues with the stated importance the public assigns to the issues. A discussion of the analysis methodology is presented in Appendix D. The following section presents the results of the analysis.

4.2 PREFERENCE ANALYSIS RESULTS

An important aspect in the development of future electric power alternatives is the consideration of their public acceptability. When there are a large number of technically diverse alternatives, as is the case in this study, it is difficult to obtain a direct statement of their acceptability from the public. In general, the public has limited information on the anticipated technical performance and impacts of many of the alternatives, particularly the more advanced systems, on which to base an opinion. If the

public had the necessary technical performance information for each alternative, a direct rank ordering of the alternatives could be made. Because the public does not have the necessary information, a preference analysis operation was performed. This analysis helped to produce a ranking of the alternatives.

The analysis was based on three elements; 1) the relative importance the public attending the community meetings assigned the ten issues in question B of the survey, 2) the estimated range and most likely values of performance estimates of the alternatives and 3) the potentially decreasing value associated with decreasing levels of performance for each issue. Based on this information, a general indication of the public's preference was developed. The following sections present a comparison of the alternatives' relative preference scores. The comparisons focus on the mean preference scores. Because of the range of uncertainty associated with the anticipated performance of the alternatives, review of the preference scores revolves around the gross, rather than fine, differences between scores. A discussion of the analysis methodology is presented in Appendix C and the performance estimates are presented in Appendix E.

There are thirty-five electric power and conservation alternatives being considered for inclusion in the power development plans. Power generation alternatives include technologies such as coal-fired steam-electric power plants, hydroelectric facilities and large wind energy conversion systems. Conservation alternatives include systems that conserve electric energy from a utility grid perspective, such as building insulation, wood residential space heating and small individually owned wind electric power generating devices. The list of all thirty-five is presented in Table 5. For the purposes of comparison, the alternatives have been divided into five categories: conventional, coal-based, distillate and natural gas, renewable, and conservation alternatives.

Conventional Alternatives

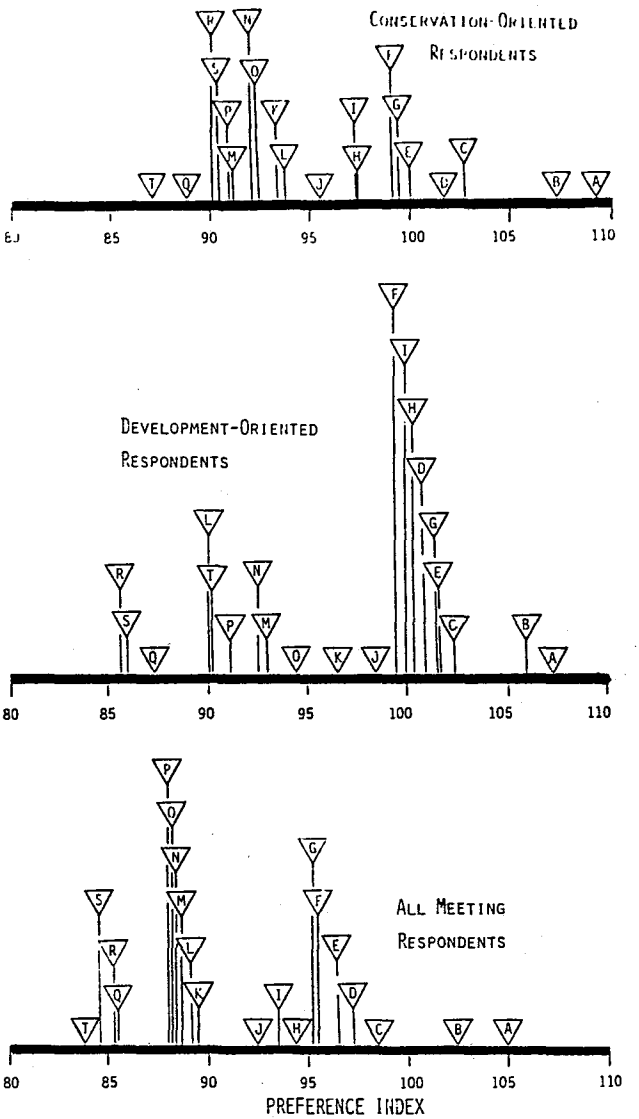
Conventional alternatives consist of those technologies that are currently available for commercial order. This category of twenty-one alternatives is the second largest of the five categories. It includes

TABLE 5. Candidate Electric Power and Conservation Alternatives

Coal Steam Electric
Coal Gasifier Combined Cycle
Coal Gasifier Fuel Cell Combined Cycle
Natural Gas Steam Electric
Natural Gas Combustion Turbines
Natural Gas Combined Cycle
Natural Gas Fuel Cell Stations
Distillate Combustion Turbine
Distillate Combined Cycle
Distillate Fuel Cell Stations
Diesel Electric
Refuse Derived Fuel Steam Electric
Geothermal Steam Electric
Large Wind Power Stations
Solar Photovoltaic Stations
Solar Thermal Electric Plants
Cook Inlet Tidal
Lake Chakachamna Hydro
Keetna Hydro
Snow Hydro
Bruskansa Hydro
Cache Hydro
Browne Hydro
Talkeetna 2 Hydro
Strandline Lake Hydro
Devil Canyon Hydro
Watana Hydro
Hicks Hydro
Allison Hydro
Bradley Lake Hydro
Building Conservation
Passive Solar Heating
Active Solar Heating
Small Wind Electric Energy Generators
Wood Space Heating

13 hydroelectric projects, three natural gas-fired alternatives (combined cycle, steam electric, and combustion turbines), two oil-fired alternatives, diesel electric, and coal steam electric.

Natural gas combustion turbines and natural gas-fired combined-cycle plants rank at the top of the list in the analysis of the meeting attendees' responses to question B (Figure 1). Four hydro projects, Cache, Browne, Hicks



(A) Natural Gas Combustion Turbine
(B) Natural Gas Combined Cycle
(C) Distillate Combined Cycle
(D) Distillate Combustion Turbine
(E) Diesel Electric
(F) Natural Gas Steam Electric
(G) Coal Steam Electric
(H) Snow Hydro
(I) Bradley Lake Hydro
(J) Lake Chakachamna Hydro
(K) Devil Canyon Hydro
(L) Bruskansa Hydro
(M) Strandline Lake Hydro
(N) Watana Hydro
(O) Keefna Hydro
(P) Talkeetna 2 Hydro
(Q) Cache Hydro
(R) Browne Hydro
(S) Hicks Hydro
(T) Allison Hydro

FIGURE 1. Preference Analysis Results--Conventional Alternatives

and Allison, are the least potentially preferred conventional alternatives, as shown in Figure 1. In examining the conventional alternatives using the issue weights assigned by the conservation-oriented and development-oriented respondents, the results, presented in Figure 1, indicate that both groups tended to rank Cache and Browne hydroelectric projects at the bottom of their list due to the relatively high estimated fish and wildlife impacts. Natural gas combustion turbines and natural gas combined-cycle plants were ranked one and two, respectively, by both the conservation and development groups. In general, non-hydro conventional alternatives received potential public preference scores slightly higher than the hydro alternatives in all cases.

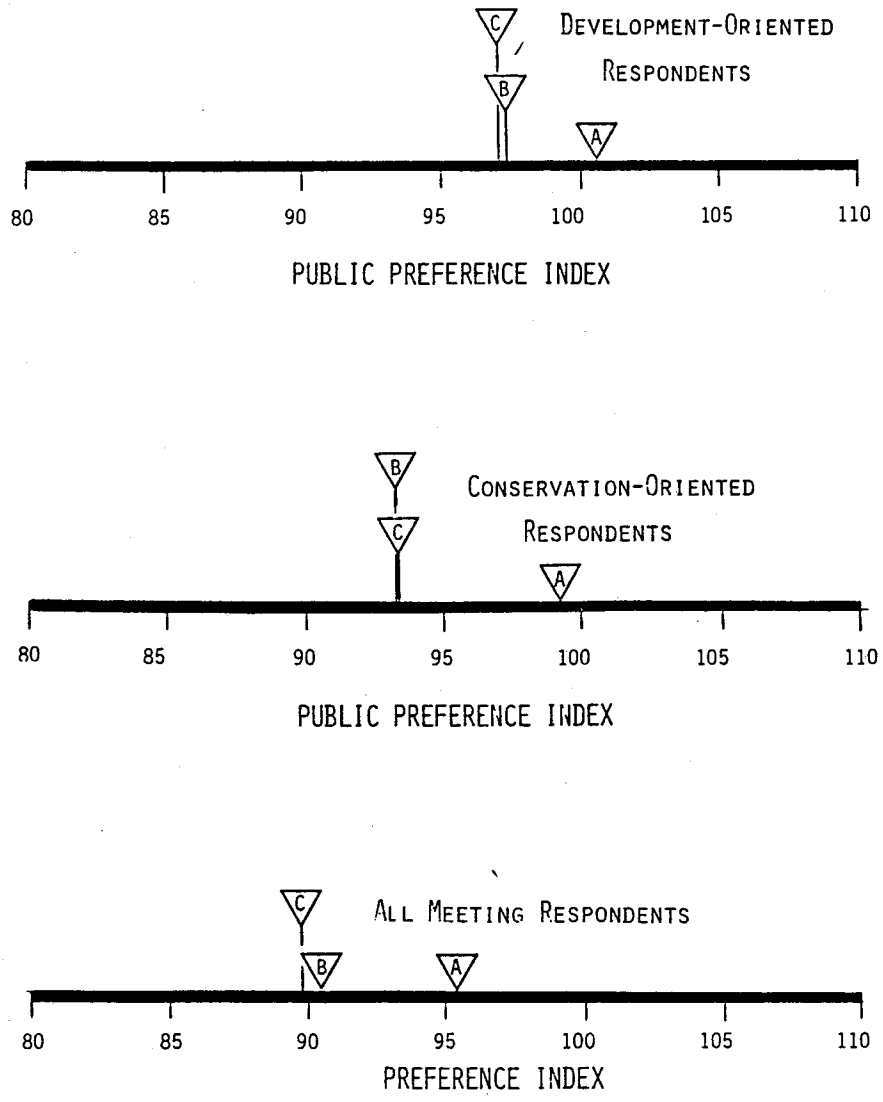
Coal Alternatives

Coal-fired steam-electric power plants, coal gasifier combined-cycle plants, and coal gasifier fuel cell combined-cycle plants are the three coal-based alternatives being considered for the Railbelt. Of these three, coal steam-electric received a high relative preference ranking by the meeting attendees, the conservation-oriented and development-oriented respondents due primarily to its relatively low estimated catastrophic accident potential. Coal gasifier combined-cycle plants and coal gasifier fuel cell combined-cycle units were almost indistinguishable in their mean public preference scores for all three analysis groups. Their estimated performance levels were similar for many of the issues. The range between coal-fired steam electric and the other two coal alternatives remained relatively constant in each analysis effort, as can be seen in Figure 2.

Distillate and Gas Alternatives

Eight distillate and gas alternatives are being considered as possible candidates for development in the Railbelt. The four natural gas-fired alternatives are gas combustion turbines, gas combined-cycle plants, gas fuel cells, and gas steam-electric plants. The four oil-fired alternatives are distillate combustion turbine, distillate combined-cycle plants, distillate fuel cells, and distillate-based diesel electric plants.

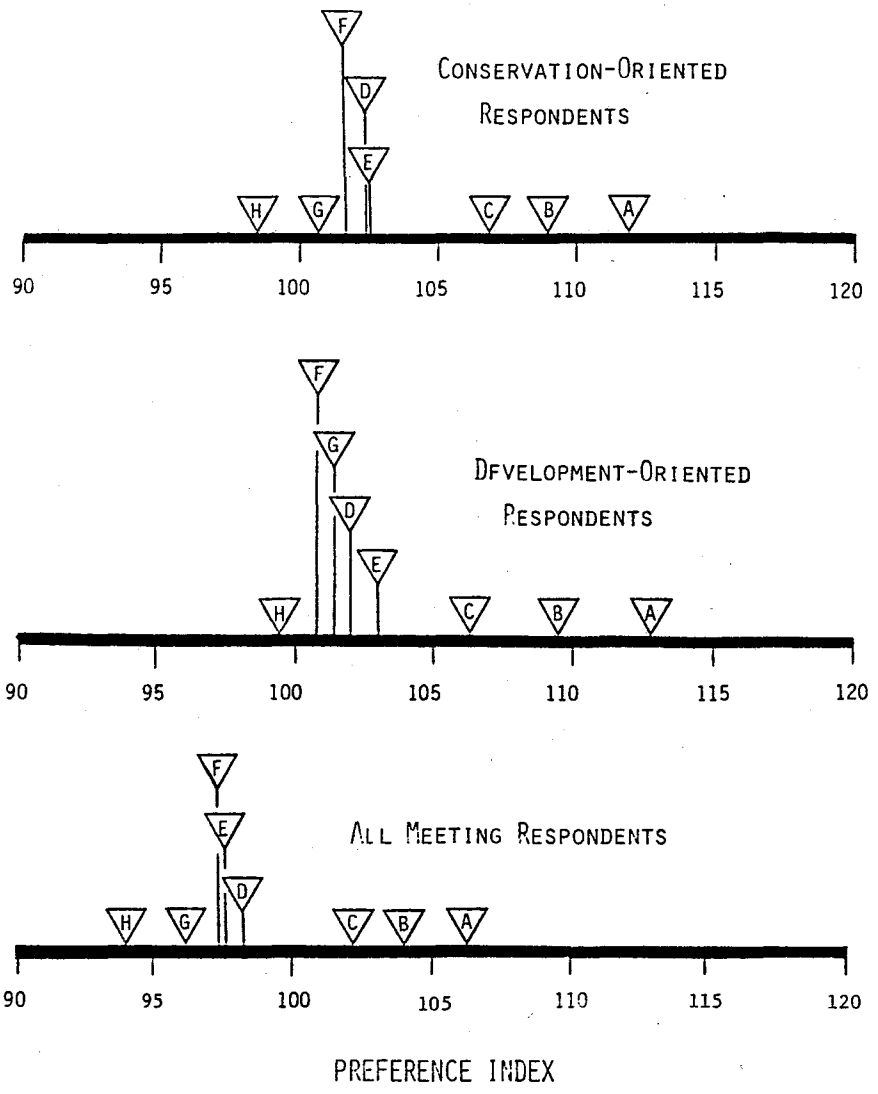
Due to their relatively low environmental impact for the amount of power produced and their moderate cost of electricity, the natural gas fuel cell



(A) COAL STEAM ELECTRIC
(B) COAL GASIFIER FUEL CELL COMBINED CYCLE
(C) COAL GASIFIER COMBINED CYCLE

FIGURE 2. Preference Analysis Results--Coal Alternatives

plants, the natural gas-fired combustion turbines and natural gas combined cycle plants were ranked first, second and third, respectively, by the majority of respondents in all three analysis groups. As shown in Figure 3, the remaining six alternatives were generally ranked somewhat as a group, with



(A) NATURAL GAS FUEL CELL

(B) NATURAL GAS COMBUSTION TURBINE

(C) NATURAL GAS COMBINED CYCLE

(D) DISTILLATE COMBINED CYCLE

(E) DISTILLATE FUEL CELL STATIONS

(F) DISTILLATE COMBUSTION TURBINE

(G) DIESEL ELECTRIC

(H) NATURAL GAS STEAM ELECTRIC

FIGURE 3. Preference Analysis Results--
Distillate and Gas Alternatives

natural gas-fired steam-electric plants falling at the bottom of the list for the conservation-oriented, development-oriented and entire community meeting respondents.

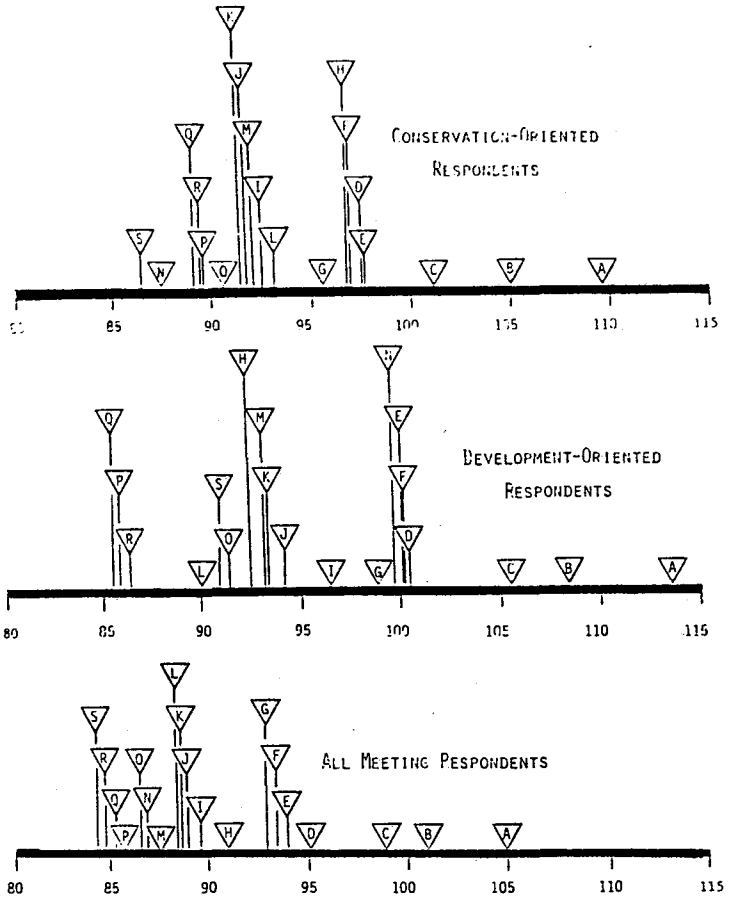
Renewable Alternatives

The renewable alternative category contains 19 alternatives that use renewable resources. The majority, 13, are river or lake hydroelectric projects. The remaining six alternatives are solar thermal electric plants, solar photovoltaic stations, refuse-derived fuel steam-electric plants, and large wind energy conversion stations.

The preference analysis indicated that of these 19 alternatives the meeting attendees would rank refuse-derived fuel steam-electric plants the highest. Next were solar thermal electric plants, followed by geothermal steam electric. As can be seen in Figure 4, these three alternatives stand apart in their scores from the remaining renewable alternatives. This is also the case, as shown in Figure 4, for their rankings by the conservation- and development-oriented respondents. The meeting attendees and conservation group responses tended to bunch a large number of the hydro and the tidal alternatives at the mid to low end of the scoring range. The development-oriented respondent's weighting of the issues created a distinct low-end group of alternatives consisting of Cache, Hicks and Browne hydroelectric. One alternative on which the conservation and development-oriented groups appear to hold distinctly different views is the Cook Inlet Tidal Project. As shown in Figure 4, the Cook Inlet Tidal plant is ranked very low by the conservation group while it falls in the upper half of the preference range for the development-oriented group.

Conservation Alternatives

Potential conservation alternatives for the Railbelt region are passive solar space heating, active solar space and hot water heating, small-wind energy conversion systems, wood residential space heating, and building conservation (insulation). These do not produce any electricity but rather displace the need for electricity in the buildings where they are installed. In the case of the solar and wind alternatives, operation is directly linked

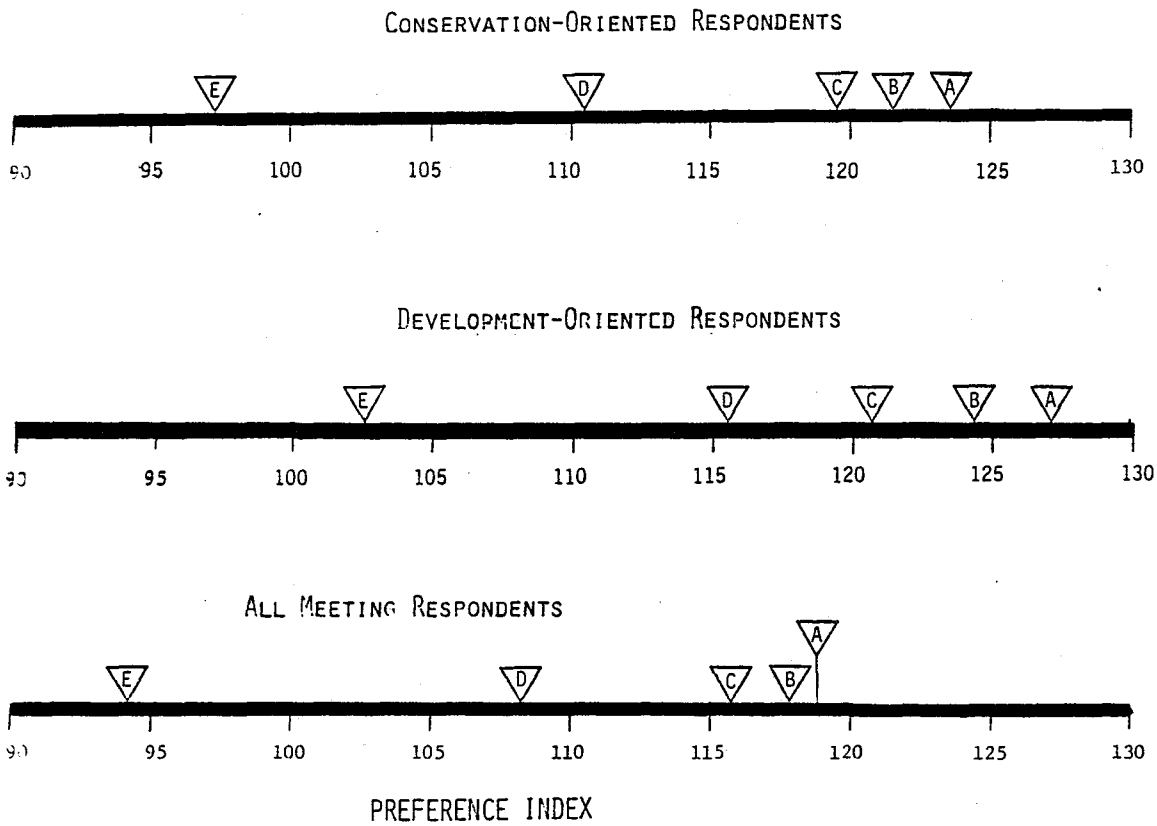


(A) Refuse-Derived Fuel Steam Electric
(B) Solar Thermal Electric
(C) Geothermal Steam Electric
(D) Snow Hydro
(E) Bradley Lake Hydro
(F) Large Wind Power Stations
(G) Lake Chakachamna Hydro
(H) Solar Photovoltaic Stations
(I) Devil Canyon Hydro
(J) Watana Hydro
(K) Keetna Hydro
(L) Bruskansa Hydro
(M) Strandline Lake Hydro
(N) Cook Inlet Tidal
(O) Talkeetna 2 Hydro
(P) Hicks Hydro
(Q) Browne Hydro
(R) Cache Hydro
(S) Allison Hydro

FIGURE 4. Preference Analysis Results--Renewable Alternatives

with weather conditions and are therefore intermittent. The total effect of the widespread use of these alternatives can be to reduce the need to operate certain cycling generation units and thereby save fuel.

The rank ordering by preference of the five alternatives was the same for the meeting attendees, the conservation-oriented group and the development-oriented group. Building conservation was given the highest score, followed by passive solar heating, active solar heating, small wind generators and finally wood residential heating (Figure 5). Building conservation and the two solar heat alternatives were generally grouped at the top of the preference ranges. Small wind generators fell about midway. Although the wood residential heat alternative was ranked appreciably lower than any other conservation alternative because of its estimated air emissions, scenic impacts and long-term health impacts, it ranks relatively high in comparison to all the other non-conservation alternatives. In fact, the three top conservation alternatives (analyzed on a 200 megawatt-electric equivalent basis) received highest public preference scores of all 35 alternatives being reviewed for all the analysis groups.



(A) BUILDING CONSERVATION
(B) PASSIVE SOLAR HEAT
(C) ACTIVE SOLAR HEAT
(D) SMALL WIND GENERATORS
(E) WOOD RESIDENTIAL HEAT

FIGURE 5. Preference Analysis Results--
Conservation Alternatives

5.0 ENERGY RESOURCE DEVELOPMENT - SURVEY OPINION RESULTS

The third question in the opinion survey examined the various energy resources the respondents feel should be emphasized when meeting the Railbelt's electric power needs. The Railbelt region has a large variety of energy resources that could be used for electric energy generation. Eleven energy resources that could assist in meeting projected electric demands are presented in this section (Table 6).

As in the first question of the survey, the respondents were asked to indicate their level of agreement or disagreement (strongly agree, agree, indifferent, disagree, or strongly disagree) with the emphasis of various energy resources. Their responses were scored with 2 points for strongly agree, 1 point for agree, 0 points for indifferent, -1 point for disagree and -2 points for strongly disagree.

As indicated in Table 6, meeting attendees agreed most strongly that conservation measures should be emphasized in future Railbelt electric needs. A second energy resource the attendees generally felt should be used was hydro (receiving a score of 1.1). The following five energy resources, ranked according to their average scores, were all renewable based resources. As presented in Table 6, the meeting attendees scored natural gas and coal and coal-based synthetic fuels relatively low (0.3 and 0.1 points, respectively). The attendees tended to disagree with the idea of emphasizing peat and peat-based synthetic fuels or nuclear power in meeting their electric needs. Peat resources received an average score of -0.3 while nuclear received a score of -0.6.

In reviewing the responses of the conservation-oriented and development-oriented individuals that completed the opinion survey, there are some distinct differences of opinion concerning which resources should be emphasized. Although both groups agreed that conservation measures should be emphasized, it was not at the top of the list for the development respondents as it was for the conservation respondents. As shown in Table 7, the development-oriented group indicated a stronger agreement that coal and coal-based synthetic fuels should be emphasized (2.2 points). The development-oriented respondents

TABLE 6. Average Scores and Rankings of Meeting Attendees on Energy Resources to be Emphasized in Meeting Future Electric Needs

Energy Resources	Average Score[a]	Rank Order
Conservation	1.5	1
Hydro	1.1	2
Solar	0.8	3
Geothermal	0.7	4
Refuse and Wood Waste	0.6	5
Wind	0.6	5
Tidal	0.5	6
Natural Gas	0.3	7
Coal and Coal-based Synthetic Fuels	0 1	8
Peat and Peat-based Synthetic Fuels	-0.3	9
Nuclear	-0.6	10

(a) The average score was based on the number of individuals expressing an opinion on the following scale: strongly agree = 2, agree = 1, indifferent = 0, disagree = -1, strongly disagree = -2.

also felt that hydro and tidal resources should be emphasized. Solar, wind, geothermal and nuclear all received negative scores from the development-oriented group (-0.1, -0.4, -0.4, -0.7 respectively). Of these four resource categories, the conservation-oriented group assigned a negative score to only one, nuclear (-1.6). The other three received relatively high positive scores; wind, 1.0, solar 1.0, and geothermal 0.6. As shown in Table 7, the conservation-oriented group on the average favored the emphasis of renewable resources, other than tidal, and expressed an indifference or lack of favor for the fossil fuel options, natural gas (0), coal resources (-0.3) and peat (-0.8).

Table 7. Average Scores and Rankings of Conservation-Oriented and Development-Oriented Respondents on Future Energy Resources to be Emphasized in Meeting Electric Needs

Issues	Average Score[a]	
	Conservation-Oriented Responses	Development-Oriented Responses
Conservation	1.8	1.2
Wind	1.0	-0.4
Solar	1.0	-0.1
Refuse and Wood Waste	0.7	0
Hydro	0.6	1.2
Geothermal	0.6	-0.4
Natural Gas	0	0.6
Tidal	-0.2	1.0
Coal and Coal-based Synthetic Fuels	-0.3	2.2
Peat and Peat-based Synthetic Fuels	-0.8	0
Nuclear	-1.6	-0.7

(a) The average score was based on the number of individuals expressing anopinion on the following scale: strongly agree = 2, agree = 1,indifferent = 0, disagree = -1, strongly disagree = -2.

s;

or

8).

6.0 STATE ENERGY DEVELOPMENT INCENTIVES - SURVEY OPINION RESULTS

To encourage the development of certain electric power and conservation alternatives, it has been proposed that the State of Alaska initiate incentive programs. In the fourth question of the opinion survey, the respondents were requested to indicate how they felt concerning the use of state incentive programs to promote four general groups of alternatives. These four groups are as follows:

- conservation alternatives
- small-scale alternatives using renewable resources (solar, hydro, wind)
- large-scale alternatives using renewable resources (solar, hydro, wind, geothermal, tidal, wood waste, refuse)
- alternatives using synthetic fuels obtained from Alaska coal or peat.

The respondents indicated their agreement or disagreement with the use of state incentive programs to promote these alternatives by marking the appropriate box. The responses were scored the same as for the first and third questions of the survey: 2 points for strongly agree, 1 point for agree, 0 points for indifferent, -1 point for disagree and -2 points for strongly disagree. The resulting scores are presented in Table 8.

The average scores of all meeting respondents indicated an agreement or strong agreement with the possible use of state programs to promote conservation (1.5 points), small-scale (1.2) and large-scale (0.9) alternatives using renewable resources. Alternatives using synthetic fuels obtained from Alaska coal or peat were apparently not favored by the meeting attendees for promotion with state incentive programs. This group of alternatives received an average score of -0.2 points.

The conservation-oriented respondents felt rather strongly that state incentive programs should be used to promote conservation (1.8 points). As shown in Table 8, small-scale renewable alternatives also received a strong score from this group, 1.5 points. They also agreed, but to a lesser degree, that large-scale renewable resource-based alternatives should be promoted,

Table 8. Average Scores Respondents Assigned to Electric Power Alternatives the State Should Promote with Incentive Programs

Electric Power Alternatives	Average Scores[a]		
	All Meeting Respondents	Conservation-Oriented Respondents	Development-Oriented Respondents
• Conservation alternatives	1.5	1.8	0.5
• Small-scale alternatives using renewable resources (solar, wind, hydro)	1.2	1.5	0.4
• Large-scale alternatives using renewable resources (solar, wind hydro, geothermal, tidal, wood waste, refuse)	0.9	0.7	0.2
• Alternatives using synthetic fuels obtained from Alaskan coal or peat	-0.2	-0.4	0.9

(a) The average score was based on the number of individuals expressing an opinion on the following scale: strongly agree = 2, agree = 1, indifferent = 0, disagree = -1, strongly disagree = -2.

resulting in an average score of 0.7. The conservation-oriented respondents somewhat disagreed with the idea of incentives programs with alternatives using synthetic fuels (-0.4). But, of the four categories of alternatives, the development-oriented respondents generally agreed the most strongly that alternatives using synthetic fuels should be promoted in this manner. The other three alternative groups also received positive scores from the development-oriented group. Conservation alternatives received a score of 0.5; small-scale and large-scale alternatives using renewable resources received respective scores of 0.4 and 0.2.

APPENDIX A

MAIL-IN SURVEY RESULTS

APPENDIX A

MAIL-IN SURVEY RESULTS

At the Talkeetna and Fairbanks community meetings held the week of May 18-22, 1981, several individuals requested additional copies of the questionnaire to distribute within their communities. Approximately forty copies of the opinion survey questionnaire were picked up for distribution. During the next few weeks following the meetings, 34 completed survey forms were returned by mail. The resulting average responses and scores are presented in Tables A-1 through A-4.

The responses of this mail-in group are presented separately from those of meeting attendees because of the uncertainty of the background information and survey completion instructions the mail-in group received prior to filling out the survey. The results of the 34 surveys parallel closely those of the conservation-oriented meeting participants.

TABLE A-1. Average Scores and Rankings Mail-In Respondents Assigned to Planning Objections

Statement	Average Score (a)	Rank Order
Alternatives using renewable energy resources (wind, tidal, solar, hydro, geothermal, wood waste and refuse) should be given preference over alternatives not using renewable resources.	1.9	1
The protection of fish and wildlife resources should be the primary objective when meeting Railbelt electric power needs.	1.4	2
The protection of the following Alaskan environments should be the primary objective when meeting Railbelt electric power needs:		
a) Forest, meadow, muskeg and tundra,	1.2	4
b) Streams, lakes and rivers,	1.4	2
c) Saltwater and coastline.	1.4	2
Electric power development should be based on local, small-scale generating alternatives.	1.3	5
Maintenance or improvement of air quality should be the primary objective when meeting Railbelt electric power needs.	1.1	6
Conservation alternatives should be given preference over electric generating alternatives.	0.7	7
The retention of dollars within Alaska spent on construction, operation and maintenance should be the primary objective when meeting Railbelt electric power needs.	0.5	8
Minimizing the risk of future inflation in electric power costs should be the primary objective when meeting Railbelt electric power needs.	0.2	9
Minimizing the cost of power should be the primary objectives when meeting Railbelt electric power needs.	0.2	9
Increasing the reliability of the electric service should be the primary objective when meeting Railbelt electric power needs.	-0.1	10
Creation of jobs should be the primary objective when meeting Railbelt electric power needs.	-0.6	11
Encouragement of large-sale industrial growth should be the primary objective when meeting Railbelt electric power needs.	-1.6	12

(a) The average score was based on the number of individuals expressing an opinion on the following scale: strongly agree = 2, agree = 1, indifferent = 0, disagree = -1, strongly disasgree = -2.

TABLE A-2 Average Relative Importance Mail-In Respondents Assigned to Electric Power Alternatives Selection Issues

Issues	Number of Points	Rank Order
Protecting fish & wildlife resources	20.0	1
Protecting the scenic quality of the region	15.3	2
Protecting air quality	13.9	3
Avoiding long-term health effects	12.1	4
Avoiding potential catastrophic accidents	10.9	5
Minimizing energy costs	8.6	6
Promoting energy self-reliance	7.6	7
Avoiding "boom-bust" social impacts	4.9	8
Promoting in-state power related employment	3.6	9
Reducing consumer effort	3.1	10

TABLE A-3. Average Scores and Rankings of Mail-In Respondents on Energy Resources to be Emphasized in Meeting Future Electric Needs

Issues	Average Score[(a)]	Rank Order
Conservation	1.4	1
Solar	1.4	1
Wind	1.3	2
Geothermal	1.3	2
Tidal	0.7	3
Natural Gas	0.4	4
Refuse and Wood Waste	0.3	5
Hydro	-0.2	6
Coal and coal-based synthetic fuels	-0.6	7
Peat and peat-based synthetic fuels	-0.9	8
Nuclear	-1.5	9

(a) The average score was based on the number of individuals expressing an opinion on the following scale: strongly agree = 2, agree = 1, indifferent = 0, disagree = -1, strongly disasgree = -2.

TABLE A-4. Average Scores Mail-In Respondents Assigned to Electric Power Alternatives the State Should Promote with Incentives Programs

Electric Power Alternatives	Average Score[a]
Small-scale alternatives using renewable resources (solar, wind, hydro)	1.5
Conservation alternatives	1.2
Large-scale alternatives using renewable resources (solar, wind, hydro, geothermal, tidal, wood waste, refuse)	0.4
Alternatives using synthetic fuels obtained from Alaska coal or peat	-0.7

(a) The average score was based on the number of individuals expressing an opinion on the following scale: strongly agree = 2, agree = 1, indifferent = 0, disagree = -1, strongly disasgree = -2.

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APPENDIX B

RAILBELT ORGANIZATIONS CONTACTED

APPENDIX B

RAILBELT ORGANIZATIONS CONTACTED

The following organizations were contacted and requested to attend the April workshop sessions. They were all provided reports on the public opinion survey approach, the economic development assumptions used in the study and the descriptions of the electric power alternatives. They were requested to provide comments and suggestions on each of these topics at the workshop sessions and/or by mail.

ENVIRONMENTAL GROUPS

Alaska Public Interest Research Group
Alaska Center for the Environment
Alaska Conservation Society, UCIC
Anchorage Audubon Society
Denali Citizens' Council
Fairbanks Environmental Center
Friends of the Earth
Kenai Peninsula Conservation Society
National Audubon Society
Sierra Club - Alaska Chapter
Sierra Club - Alaska Office
Sierra Club - Denali Chapter
Susitna Study Group
Trustees for Alaska

RECREATIONAL GROUPS

Knik Kanoers and Kayakers
Mountaineering Club of Alaska

ENERGY GROUPS

Alternative Energy Resource Center
Alaska Rural Electric Coop Association

Alaska Energy Extension Services
Alaska Regional Energy Association
Heritage Conservation and Recreation Services
Susitna Power Now

GENERAL PUBLIC INTEREST GROUPS

Federation of Community Councils
League of Women Voters-Anchorage
State League of Women Voters

SPORTSMENS GROUPS

Eagle River Sportsmen's Game Preservation Society
Izaac Walton League of America

MINING GROUPS

Alaska Miners Association

COMMERCIAL FISHING GROUPS

Cook Inlet Aquaculture Association
Commercial Fisherman of Cook Inlet
North Pacific Fishermen's Association

CHAMBER OF COMMERCE

Anchorage Chamber of Commerce
Fairbanks Chamber of Commerce
Homer Chamber of Commerce
Kenai Chamber of Commerce

LOCAL, STATE AND FEDERAL AGENCIES

City of Palmer
City of Valdez
City of Delta Junction
Municipality of Anchorage

Fairbanks Northstar Borough
City of Fairbanks
Mat-Su Borough
U.S. Fish and Wildlife Services
U.S. Geological Services
Alaska Department of Natural Resources
Bureau of Land Management

RAILBELT UTILITIES

Eielson Air Force Base
Chugach Electric Association
Matanuska Electric Association
Anchorage Municipal Light and Power
Golden Valley Electric Association
Fairbanks Municipal Utility
Copper Valley Electric Association
Homer Electric Association
Seward Electric System
Elmendorf Air Force Base
Fort Richardson Power Plant

BUSINESS GROUPS

Commonwealth North

APPENDIX C

PREFERENCE ANALYSIS METHODOLOGY

APPENDIX C

PREFERENCE ANALYSIS METHODOLOGY

Whenever a decision involves of a large number of issues and options there is a potential need for a structured decision analysis. In the case of this study, there is a need to identify the most appropriate electric power and conservation alternatives for possible future Railbelt development. One aspect of the identification operation is the consideration of the public's preferences. With 35 alternatives and 10 major issues associated with the selection of the alternatives, obtaining a statement from the public on their preferences for each of the 35 is extremely difficult, if not impossible. Many people have limited technical information on which to base an opinion about many of the alternatives. They do, though, have definite views on which issues are important in the selection of the alternatives. Using these views in the form of the importance of each of the 10 issues (as obtained through Section B of the opinion survey), the estimated performance of the 35 alternatives, and the value functions (the changing importance of value associated with changing performance), a preference analysis exercise was undertaken. The results provide an indication of the potential public preference for the development of the various alternatives.

Prior to the development of the opinion survey form, three crucial items of information were identified: the decision problem, the alternatives, and the decision group. This information provided the foundation and direction of the preference analysis activities.

The basic decision problem addressed using the decision analysis methodology is the identification of the electric power alternatives that the Alaskan public would potentially prefer to see developed in the Railbelt.

The 35 electric power and conservation alternatives selected for review as candidates for future Railbelt development were all considered to have some potential technical viability for the Railbelt and to be commercially available prior to the year 2000.

The decision group participating in this study was comprised of individuals who attended the community meetings held in May. Individuals attending the meetings were not anticipated to constitute a "representative" sample of the Alaskan public. Indeed, it would be unlikely that a representative sample would be obtained since the committment of personal time required to attend a public meeting (or to respond to any form of survey short of a door-to-door survey) would tend to eliminate all but the most interested individuals from the survey process. What was expected, (and confirmed by analysis of the survey results) was the appearance of groups of individuals holding fairly well-defined and divergent views on issues related to future electric power development in the Railbelt. The appearance of these groups among the survey repondents provided an indication of principal points of disagreement, and agreement, and provided a basis for identifying electric power alternatives that might be favored or disfavored by either one or both groups.

TECHNOLOGY SELECTION ISSUES

The primary objective in the development of any alternative is to improve the quality of life in the Railbelt region. Associated with achieving this objective are four major subobjectives: 1) the consumer should experience minimum electric energy cost and operational inconvenience; 2) environmental degradation should be minimized; 3) the public's health and safety should not be compromised; and 4) impacts to the socioeconomic structure of the region should be minimized. The 10 issues presented in Section B of the survey issues are considered to address the major factors in achieving these subobjectives.

A preliminary list of specific issues within the subobjectives described above was developed based on discussions with individuals involved in the Railbelt electric power planning, reviews of public comments at past Railbelt community meetings (such as the Alaska Power Administration's Susitna Hydro community meetings and the Alaska Public Forum community meetings) and examinations of the issues addressed in previous Railbelt energy assessment studies. Representatives of fifty-three organizations having a potential

interest in the study received copies of the list of issues for review and comment. Copies were sent by mail and were also presented at the April workshop sessions. (These organizations are identified in Appendix B.) The preliminary list was modified as a result of the comments received at the workshops and by mail as well as from an internal review effort. Two issues originally proposed, "impact on the consumer from the construction of excess capacity" and "the reliability of the alternatives," were replaced by two issues deemed to be of more significant concern. These were "protection of the air quality" and "avoiding potential catastrophic accidents." The remaining eight issues were rewritten for more clarity. The final ten issues identified as important to Alaskans are presented in Table C-1.

ESTIMATES OF THE PERFORMANCE OF ALTERNATIVES

Estimating the performance of the alternatives on each issue consists of two operations. First, indices for performance measurement are identified or developed. The second operation involves estimating the probable performance of the alternatives using these indices.

Some performance measures are "natural" while others are "constructed." Natural indices are composed of such units as mills per kilowatt-hour for the issue "electric energy cost" and the hours per month a consumer must devote to the operation and maintenance of a facility for the issue "reducing consumer effort." Unfortunately, not all issues have convenient units to indicate the performance of the alternatives. Many times issues are composed of multiple factors, each with their own performance measures. In these cases "constructed" indices are developed based on the important factors associated with the issues. Table C-2 presents all ten issues and their associated performance measures. A more detailed discussion of the development of the constructed indices is found in Appendix D.

Surrounding each estimate of performance is a degree of uncertainty. An advantage of the decision analysis methodology used in this study is its ability to consider effects of this uncertainty. Performance estimates were generally produced as ranges with the probability of each performance value taken into consideration in the analysis. The principal data source for the

TABLE C-1. Issues of Concern

COST AND CONVENIENCE ISSUES

- minimizing the cost of energy

  the cost of electric energy to consumers, as measured in mills/ kilowatt-hour, should be as low as possible

- reducing consumer effort

  the hours per month a consumer must devote to the actual operation and maintenance of an electric generation or conservation technology should be as few as possible

ENVIRONMENTAL ISSUES

- protecting the scenic quality of the region

  the aesthetic impact of a facility on its surrounding environment, taking into account the facility's area, height, location, and site terrain and vegetation, should be minimized

- protecting fish and wildlife resources

  the region's fish and wildlife should be protected from electric facility operational impacts measured by the quantity of water and the quality and quantity of land disturbed

- protecting air quality

  the air emissions from a facility should not significantly impact the region's air quality.

PUBLIC HEALTH AND SAFETY ISSUES

- avoiding long-term health effects

  the long-term health of a community should not be affected by the operation of an electric generation or conservation facility

- avoiding potential catastrophic accidents

  the affects of a catastrophic accident, such as the release of hazardous materials or stored energy at the facility, should be as small as possible on the surrounding communities and environment.

SOCIOECONOMIC ISSUES

- promoting in-state power-related employment

  the development and operation of electric power generation alternatives should provide direct financial benefits to Alaskans in the form of in-state expenditures and related employment opportunities for Alaskans

- avoiding "boom-bust" social impacts

  the construction of electric power alternatives should not create drastic changes in the social structure of the surrounding communities either due to the influx of construction personnel or due to their sudden departure

- promoting energy self-reliance

  individual energy self-reliance in the form of individual ownerships of dispersed electric power generation units is preferred for Alaska over large central power stations controlled and operated by the utilities and utilities, consortium, or the state.

TABLE C-2 Issues and Associated Performance Measures

Issues of Concern	Performance Measures
Minimizing energy costs	Mills per kilowatt hour consumer electric costs
Reducing consumer effort	Hours per month a consumer must devote to facility operation and maintenance
Protecting the scenic quality of the region	A constructed scenic impact scale based on the terrain, vegetation and facility size and height
Protecting fish and wildlife resources	A constructed fish and wildlife impact scale based on the land area and the amount of water consumed or affected
Protecting air quality	Pounds of pollutants emitted per million British Thermal Units (Btu) of energy in the fuel
Avoiding long-term health effects	A constructed scale based on the annual amount of air emissions and the population density surrounding the facility
Avoiding potential catastrophic accidents	A constructed catastrophic accident impact scale based on the quantity of stored energy, the rate of energy release and the persistence of the accident's impacts
Promoting in-state power related employment	Amount of total project expenditures spent out of Alaska
Avoiding "boom-bust" social impacts	A constructed boom-bust impact scale based on the surrounding community populations, the size of the construction force and the length of construction.
Promoting energy self-reliance	A constructed scale based on the nature of entity that would operate the facility

performance estimates was the technology assessment profile report prepared by Battelle and Ebasco for the Railbelt Electric Power Alternative Energy Study.[a] The performance estimates for each alternative on each issue are presented in Appendix E.

ISSUE IMPORTANCE WEIGHTS

To obtain the public's relative level of concern for each issue, a survey form was developed. A preliminary survey was produced, tested and subsequently modified. After the survey was internally tested, it was presented to the representatives of the fifty-three Alaskan organizations invited to the April workshop sessions. Their comments and concerns resulted in extensive revisions to the survey form and survey approach. The initial survey structure had been well received and applicable in the past studies for small groups of technically knowledgeable and interested individuals. However, it was not appropriate for use with large public groups having only limited information or understanding of the alternatives being considered. As a result of the responses from the workshop participants, an extensive review of the approach was undertaken. The amount of information the public was required to provide for the decision analysis effort was reduced. At the same time it was determined that additional information should be requested from the public on three topics: the electric power system planning objectives, the energy resources to be emphasized when meeting Railbelt electric power needs, and the use of electric power development incentive programs. Two additional test sessions assisted in refining the survey and the lead-in presentation. The first test session involved approximately twenty individuals at Battelle not involved with the Railbelt Electric Power Alternatives Study. The second test was performed at a local junior high school with a class of eighth-grade students. Based on these tests, minor modifications were made to the question concerning the relative importance the

(a) King, J.C. et al. 1981. Candidate Electric Energy Technologies for Future Application in the Alaska Railbelt Region. Volume IV, Prepared for the Office of the Governor, State of Alaska by Battelle, Pacific Northwest Laboratories, Richland, Washington.

public assigns to the issues (Section B). As can be seen in Figure C-1, the final format of Section B required that the respondents distribute points among the issues to indicate their relative importance.

The final survey form was presented to the participants at the community meetings held in May. Sixty-two forms were filled out at the meetings. A number of survey forms were also distributed in the Fairbanks and Talkeetna areas by participants at the community meetings. Thirty-four of these surveys, categorized as mail-in surveys, were received and the results are presented in Appendix A.

VALUE FUNCTIONS

The importance one assigns to a certain level of performance can be expected to change if the performance level is varied. For example, the relative importance of cost of power in comparison to other issues is likely to increase as the cost of power increases. In the preference analysis approach used in this study, as the performance deviated from the preferred levels, the importance associated with the specific issue is assumed to be reduced. The survey respondents were requested to assign relative importance weights to the issues based on the consideration that the preferred performance levels could be achieved. But, as the actual performance estimates of the alternatives generally fall below the preferred level, the associated importance weight is appropriately reduced. The amount of this reduction is indicated on a value function curve.

Originally it was anticipated that the value function would be based on questions in the survey on how much the importance weights should be reduced for different performance levels. Based on the comments received from the workshop participants and an internal project review operation, it was determined to generate the value functions internally. It was also determined that linear value functions would not provide significantly different results from the non-linear functions that might have been obtained from a survey effort. The value functions cover the range of performance of the electric power alternatives and provide a linear reduction in the issue importance weight as the performance deviates from the preferred level.

FIGURE C-1. Opinion Survey Question on Issue Importance

B. Please indicate your level of concern with respect to the following issues associated with selection of electric power alternatives.

Column 1 - Describe the importance of the issue using the following code:

VI - Very Important
MI - Moderately Important
LI - Little Importance
NI - No Importance

Column 2 - Indicate how important each issue is to you by distributing **100 points** *among the ten issues.*

	Issues	Column 1 (Importance)	Column 2 (Points)
Improve Quality of Life in the Railbelt	Cost and Convenience — Minimizing energy costs		
	Cost and Convenience — Reducing consumer effort		
	Environmental — Protecting the scenic quality of the region		
	Environmental — Protecting fish and wildlife resources		
	Environmental — Protecting air quality		
	Public Health and Safety — Avoiding long-term health effects		
	Public Health and Safety — Avoiding potential catastrophic accidents		
	Socioeconomic — Promoting in-state power-related employment		
	Socioeconomic — Avoiding "boom-bust" social impacts		
	Socioeconomic — Promoting energy self-reliance		

The preferred performance levels were defined as the performance of the alternative or alternatives that best achieved the issue objective. In the case of the issue "cost of power" the objective was to minimize the cost of electric power to the Railbelt customer. The estimated lowest cost of electric power of the 35 alterntives was considered to be the preferred performance and was assigned a value of 1.0. The least preferred performance, or the highest cost of electricity of the 35 alternatives received a value of 0.0. Between these extremes a linear value function was drawn. The relative value weights for the other alterantives were obtained from this linear value function.

ASSESS THE RESULTS

The fifth activity of the preference analysis effort was the assessment of the public's relative preference of the candidate electric power generation or conservation alternatives. The assessment operation was based on a methodology developed by Litchfield et al.[(a)], which combines the performance estimates for each alternative, the relative importance weights the respondent's assigned to the 10 issues, and the value functions. The results are an indication of the potential relative preferences of the respondents to the development of the various alternatives.

The assessment operation consisted of three basic activities. First, the performance estimates for each alternative on each issue were combined with the value functions for each issue area. These performance estimates generally cover a range with a varying degree of probability of achievement across this range (Appendix E). The resulting adjusted performance estimates for each alternative and each issue were then multiplied by the average importance weights the meeting respondents assigned in Section B of the survey.

(a) Litchfield, J.W., J.V. Hansen, and L.C. Beck. 1976. "A Research and Development Decision Model Incorporating Utility Theory and Measurement of Social Values." In IEEE Transactions on Systems, Man and Cybernetics, Vol. SMC-6, No. 6.

Finally, the weighted adjusted performance estimates for each alternative on all 10 issues were combined to produce a total relative preference index for that alternative. This was done for all 35 alternatives and the mean relative preference indices were then used in Section 4.2 of the report to provide an indication of the potential relative preference of the respondents.

APPENDIX D

PERFORMANCE INDICES

APPENDIX D

PERFORMANCE INDICES

A major factor in developing a preference for one alternative over another is the anticipated performance of the alternatives. In performing the preference analysis of the 35 Railbelt electric power alternatives, it was necessary to identify the possible performance of each alternative on each of the ten issues presented in the second section of the survey (e.g., cost of power and reducing consumer effort). Because of the uncertainty associated with the performance of the alternatives, the estimates were developed as ranges around the most likely performance value. In most cases the performance indicators were constructed from several performance characteristics. For example, there is no one standard indicator for the degree of social impact a facility might have on the surrounding communities. Such impacts are primarily a result of such factors as the size of the community, the size of the construction and operating crews and the length of a construction. Based on these factors, a boom-bust social impact scale was developed. Similar indices were produced for most of the other issue areas. The following sections describe the thinking and factors that went into these indices.

ENERGY COST INDICATOR

The cost of energy either generated or displaced by the various alternatives was compared on the basis of the levelized lifetime cost estimates with 1990 as the first year of commercial operation. The units of comparison were mills per kilowatt-hour in 1980 dollars. In developing the levelized lifetime cost estimates, several input assumptions were made. These included the standard facility rated capacity, capacity factor, fuel cost, unit investment, operation and maintenance costs, availability factor, construction period, lifetime payout method, and a cost uncertainty factor.

CONSUMMER EFFORT INDEX

Depending on the alternative developed, the consumer may be required to devote a certain amount of time periodically to the operation of the unit.

This is primarily the case with small-scale solar, wind and wood-fired systems. The units of comparison were the number of hours the consumer must devote to the operation of the unit. For passive solar units it was assumed that up to 5 minutes a day, or 2 1/2 hours/months, would be needed for units consisting of shutters. Active solar and small wind units would require a very brief check-out period each month. Residential wood heating would necessitate around 40 minutes a day of work, or 20 hours per month in the cold season.

SCENIC QUALITY INDEX

The impact of a facility on the scenic quality of its environment is a function of several factors. The scenic impact scale was developed based on the consideratin of the general locations in which the various alternative might be developed (the terrain and vegetation conditions) and the area and height requirements of the facility. The resulting scale ranges from 0 to 1: 0 is not apparent from about 1/2 mile; 1 is greatly apparent from about 1/2 mile distance. The resulting score was weighed by the degree it conflicts or harmonizes with its surroundings; 0 for harmonizes; 1 for greatly conflicts. The final scores were then adjusted for a standard 200-MW facility.

FISH AND WILDLIFE IMPACT INDEX

As a rough indication of an alternative's impact on the fish and wildlife of the Railbelt, an index was developed based primarily on the amount of land or water directly disturbed (for a stand and 200-MW equivalent facility). The amount of water (gallons per minute) consumed for cooling purposes or passed through power turbines was identified for each alternative. Also the land area permanently disturbed was identified. The land area was converted to a gallon-per-minute impact value based on the fact that the Railbelt has an annual 12" annual runoff (.6 gallons per minute per acre). A weighting value, based on the potential locations of the facilities, was applied to the terrestial impact figure. Remote areas were assigned a full five points. Developed areas received a weight of one point. Between these extremes fell semi-developed lands (2 points), inhabitated farm or rural areas (3 points) and unihabitated areas with no permanent settlements (4 points). The aquatic impact values were

also modified by about one half if they were turbine-pass-through flows rather than consumed water figures. The aquatic and terrestial impact values were then combined to provide a general indication of the relative degree of fish and wildlife impacts.

AIR QUALITY

The impact of the majority of the alternatives on the region's air quality is a function of sulfur dioxide, nitrogen oxide and particulate emissions. Without attempting to weight the differences in the three pollutants, the air-quality figures for the alternative were defined as the estimated total emission levels for there pollutants (in pounds per million Btu).

LONG-TERM HEALTH-IMPACT INDEX

The potential long-term health impacts on the public from the operation of a facility were assumed to be primarily a result of air emmissions. The greater the number of people exposed the greater the likelihood of long-term health problems. Therefore, the air emmission estimates were adjusted according to the general size of the community that they could potentially impact.

POTENTIAL CATASTROPHIC ACCIDENT IMPACT INDEX

The primary factors that were taken into account in the development of the scale to compare the relative hazards associated with the candidate alternatives are the amount of energy or hazardous material available at the site; the rate of release of this energy or material during an accident; and the consequences of the accident on the surrounding area. Also, two major assumptions were made. First, although all facilities are designed, constructed and operated in a manner to avoid catastrophic accidents, for comparison purposes an accident is assumed to occur. Second, all safety or backup systems are assumed to fail and the energy or material is assumed to be released.

The three primary factors of the catastrophic accident scale are the quantity of energy or hazardous materials available for release (ranging from

0, or no energy, to 4, or greater than 10^{12} Btu), the rate of release (from 0, no release, to 3, less than an hour), and the persistence of the catastrophic impacts of the accident (from 0, or none, to 4 severe, or greater than 20 years). The catastrophic impact scale ranges from 0 (no energy, no release, no impact) to 48 (major quantity of energy, rapid release, severe persistent effects).

IN-STATE EMPLOYMENT INDEX

As an indication of the possible level of in-state employment directly related to an alternative, an estimate was made of the percentage of the total expenditures that were spent outside of Alaska. This percentage included capital, operating, maintenance, fuel and financing charges.

SOCIAL BOOM-BUST INDEX

The construction and operation of a facility can have a potentially significant impact on a community. The degree of impact is a function of the size of the community, the construction crew, the remaining operating staff and the length of construction. The longer the construction period the greater the chance for the community to grow and be less influenced by the loss of the construction personnel at the completion of the job. The degree of impact on a community due to the influx of construction personnel was classified as minor (a less then 1% change), moderate (a 1% to 10% change), significant (10% to 40% change) and severe (greater than 40% change). The impacts for each alternative on the communities near the most probable development sites were identified and averaged. These figures were then adjusted based on the length of the construction period - a slight reduction in the impact values for projects requiring about seven years and a moderate reduction for projects taking over 12 years to complete.

ENERGY SELF-RELIANCE INDEX

To identify the relative degree of personal energy self-reliance the various alternatives afford, they were ranged on a scale of 1 to 5. This scale

indicated the range of ownership possible, ranging from individual to regional-state consortiums. The other three ownership options were neighborhood ownership (assigned 2 points), community utility ownership (3 points) and large utility ownership (4 points). Each of the 35 alternatives was examined and was assigned a level of probability of being owned and operated by the various entities.

APPENDIX E

PERFORMANCE ESTIMATES OF ALTERNATIVE TECHNOLOGIES

APPENDIX E

PERFORMANCE ESTIMATES OF ALTERNATIVE TECHNOLOGIES

The following tables present the estimated performance of the 35 alternative technologies on the ten major development issues. Surrounding each estimate is a range of uncertainty. The extremes of the estimate range are assigned a very low probability of occurrence. Associated with the most likely performance level is also a degree of uncertainty. For the purposes of the preference assessment activity, these most likely performance estimates were assigned a probability of 0.8. In those cases where the performance levels are highly certain, they were assigned a probability of 1.0.

A detailed description of the factors incorporated in the various indices is presented in Appendix D.

TABLE E-1. Estimated Performance of Alternatives - Cost of Power

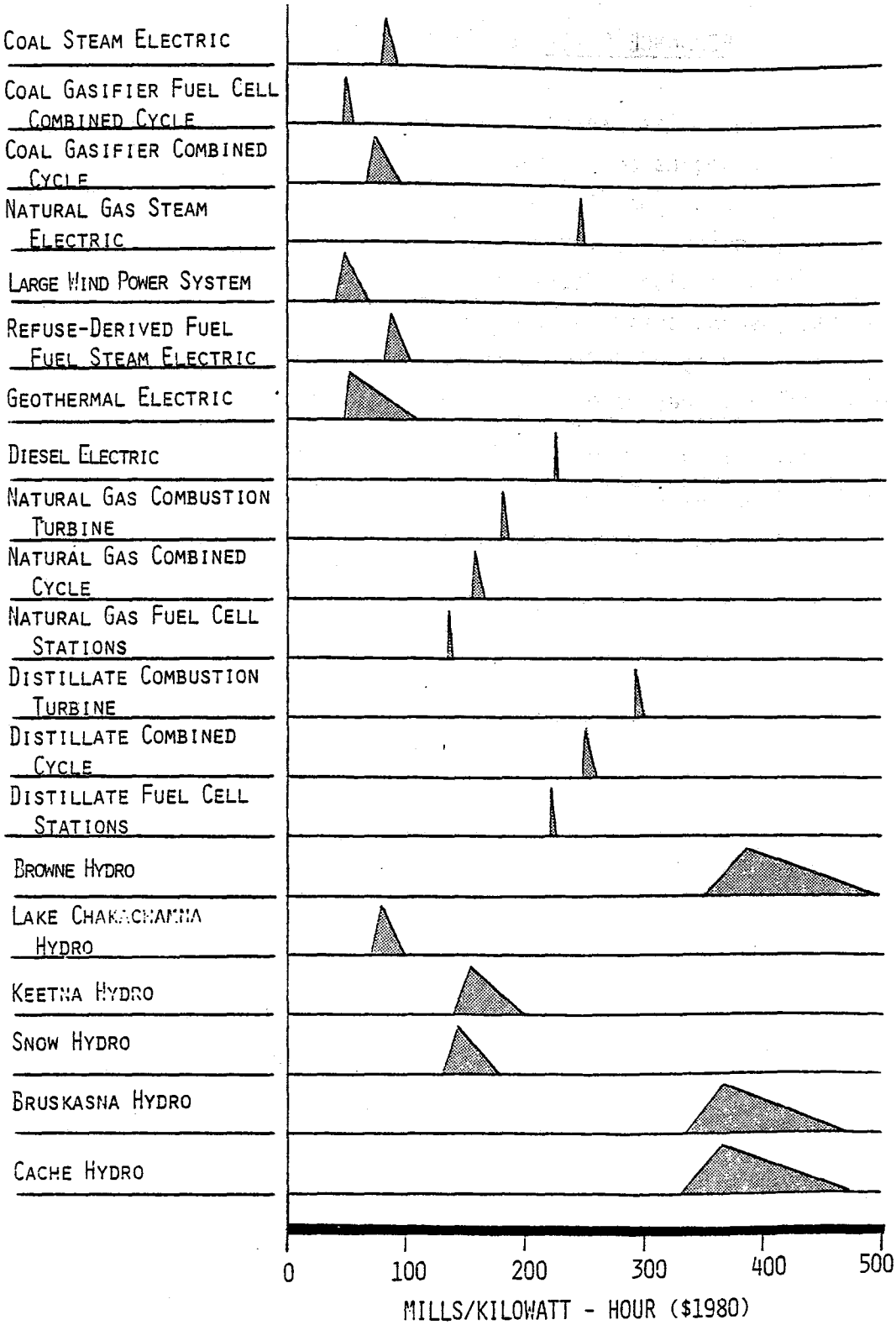


TABLE E-1. (contd)

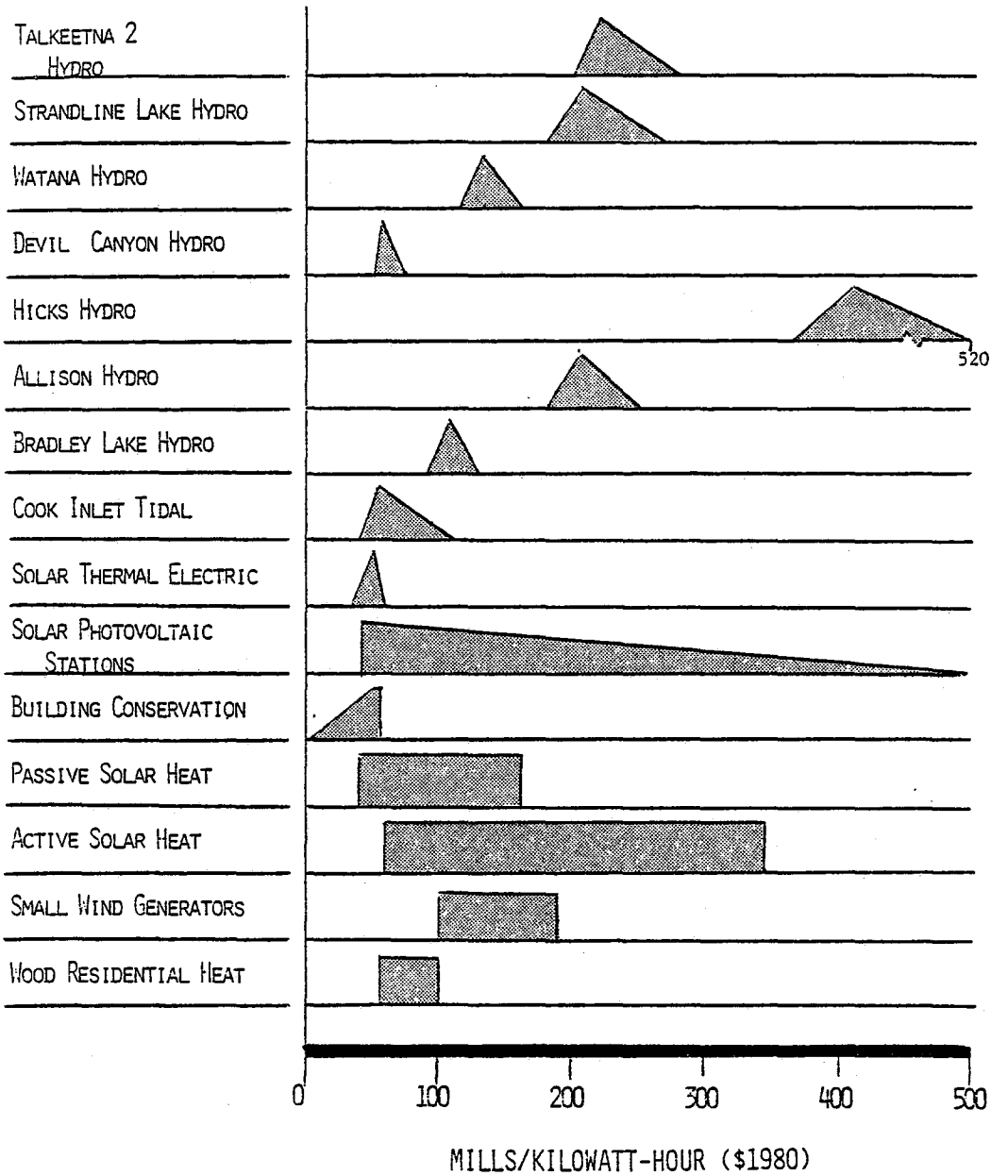


TABLE E-2. Estimated Performance of Alternatives - Consumer Effort

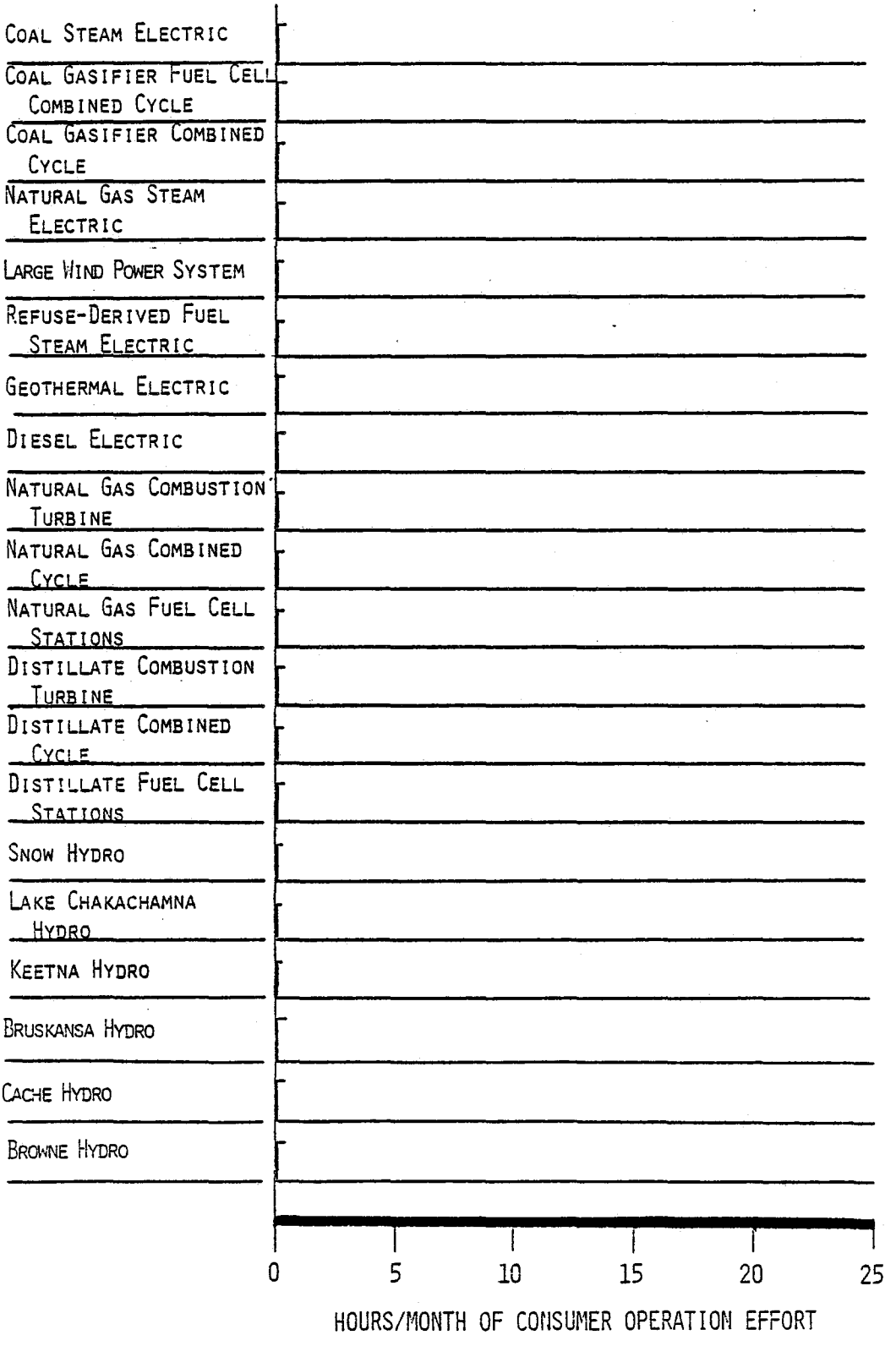


TABLE E-2. (contd)

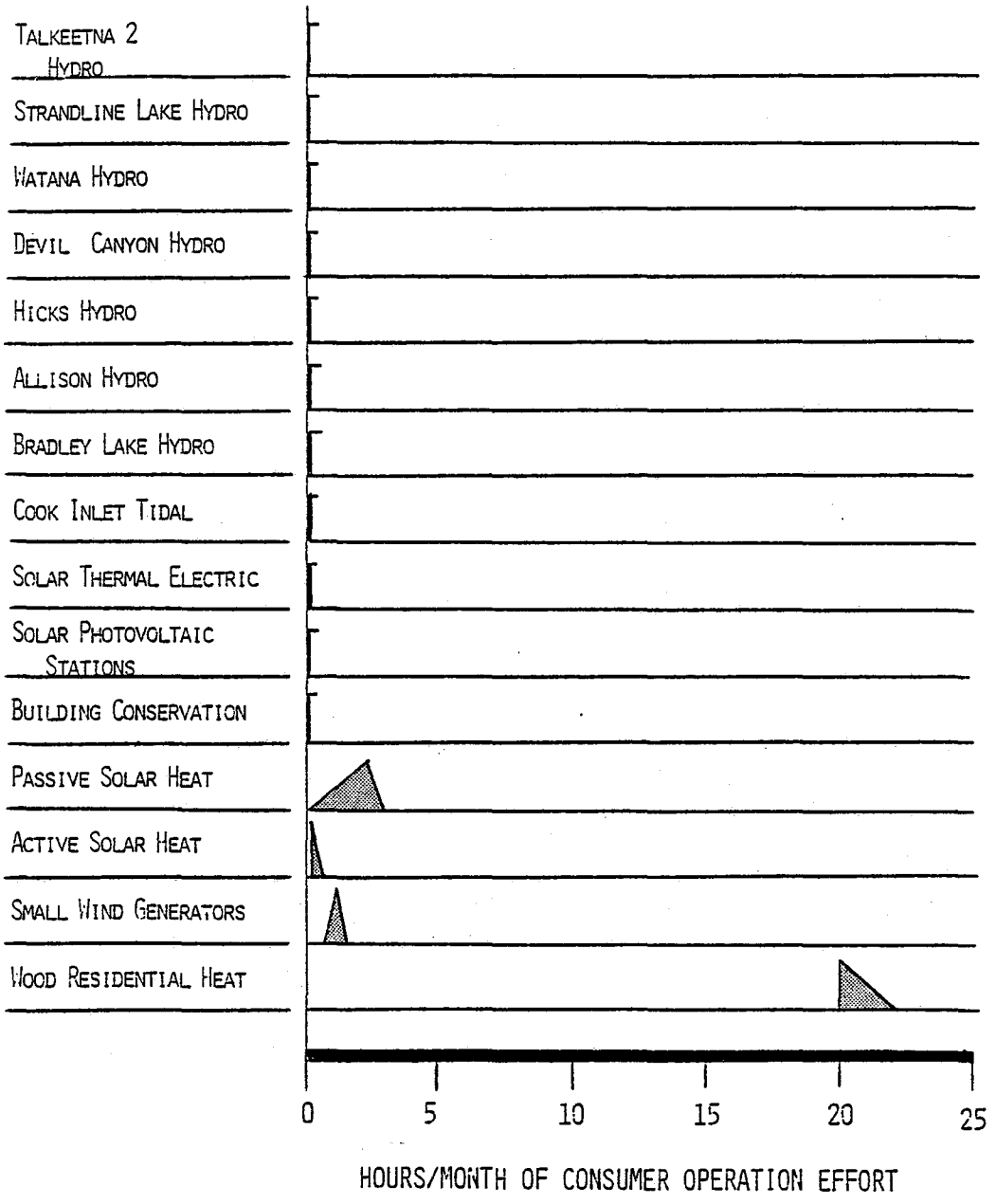
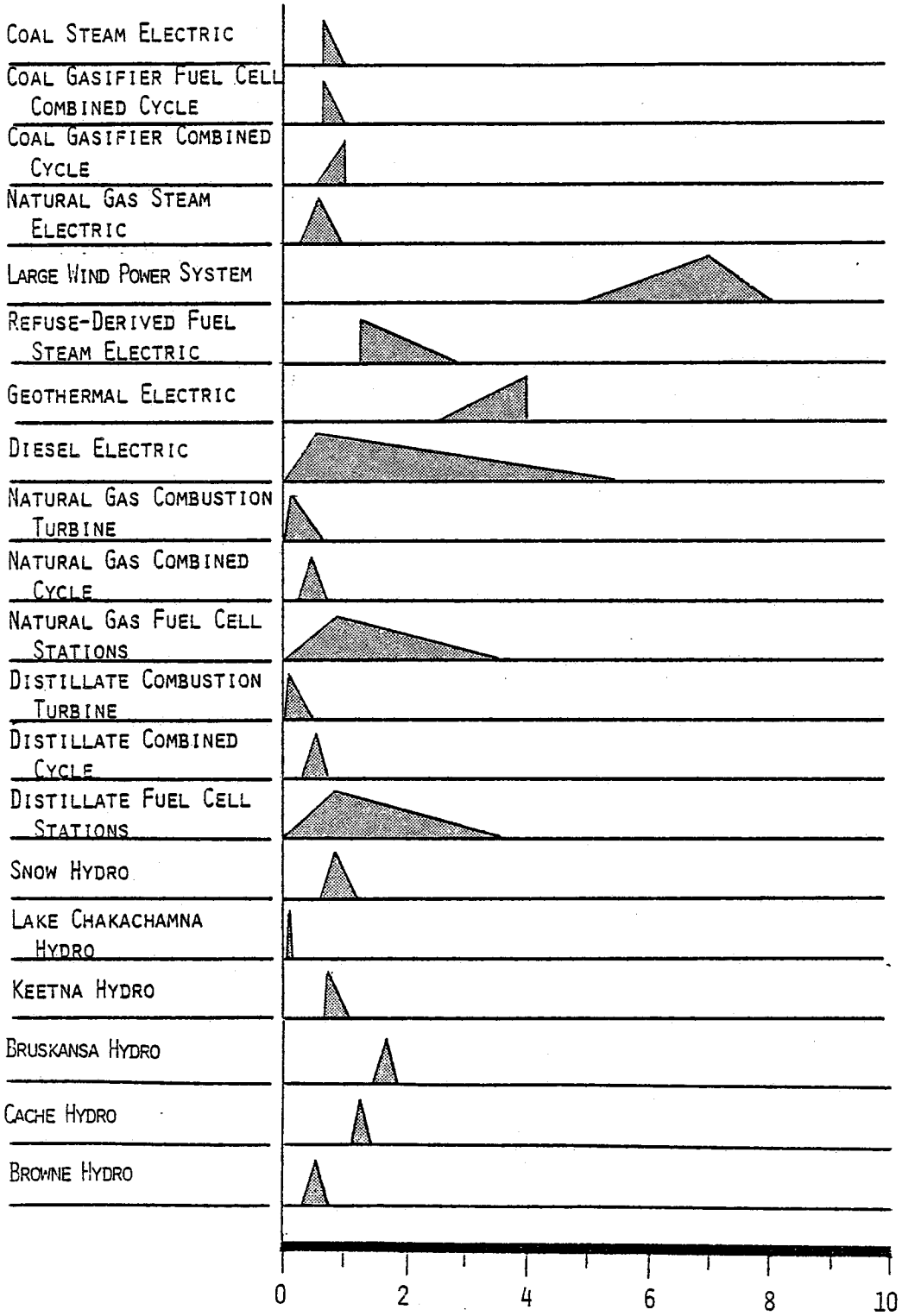


TABLE E-3. Estimated Performance of Alternatives - Scenic Impact



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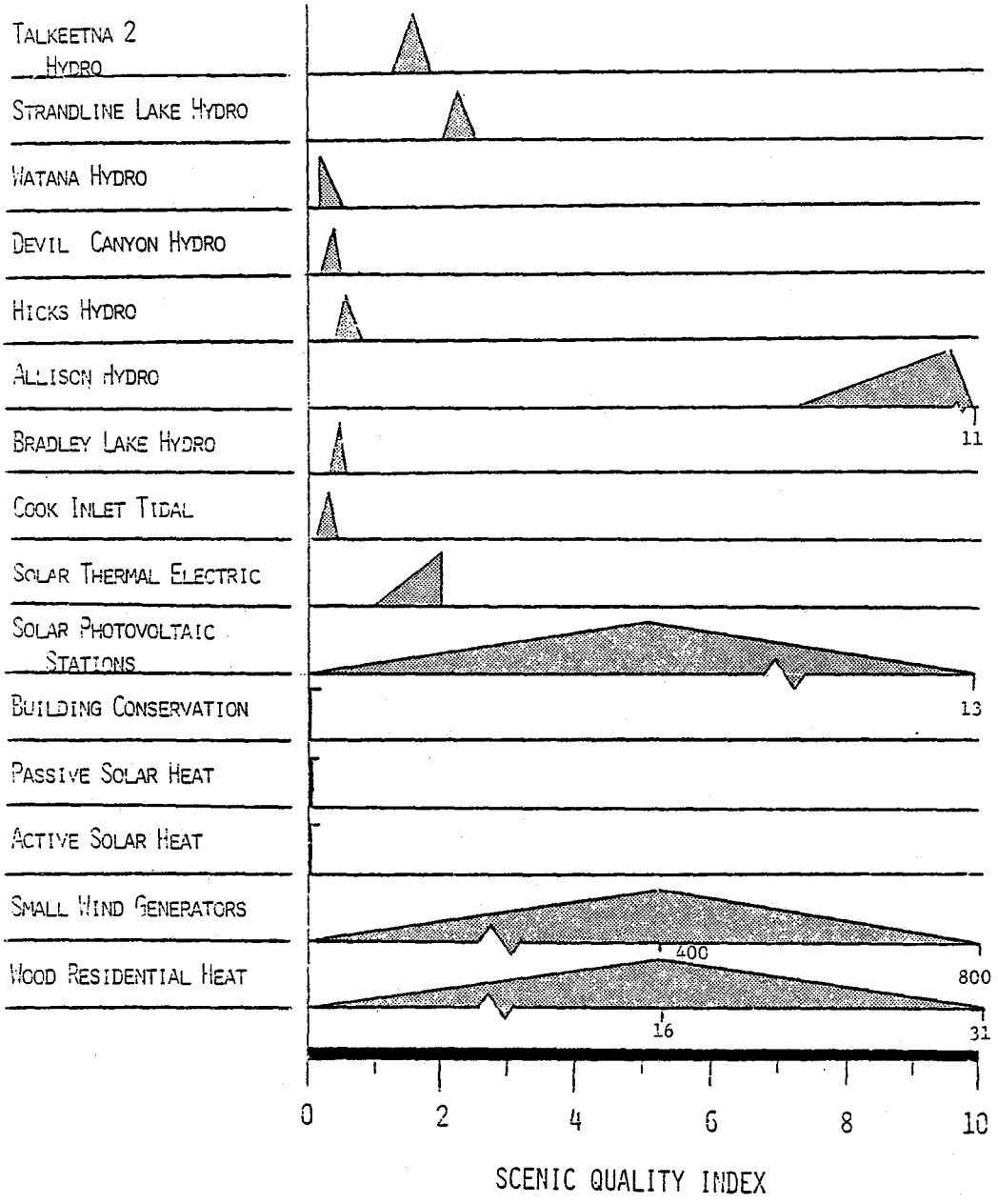
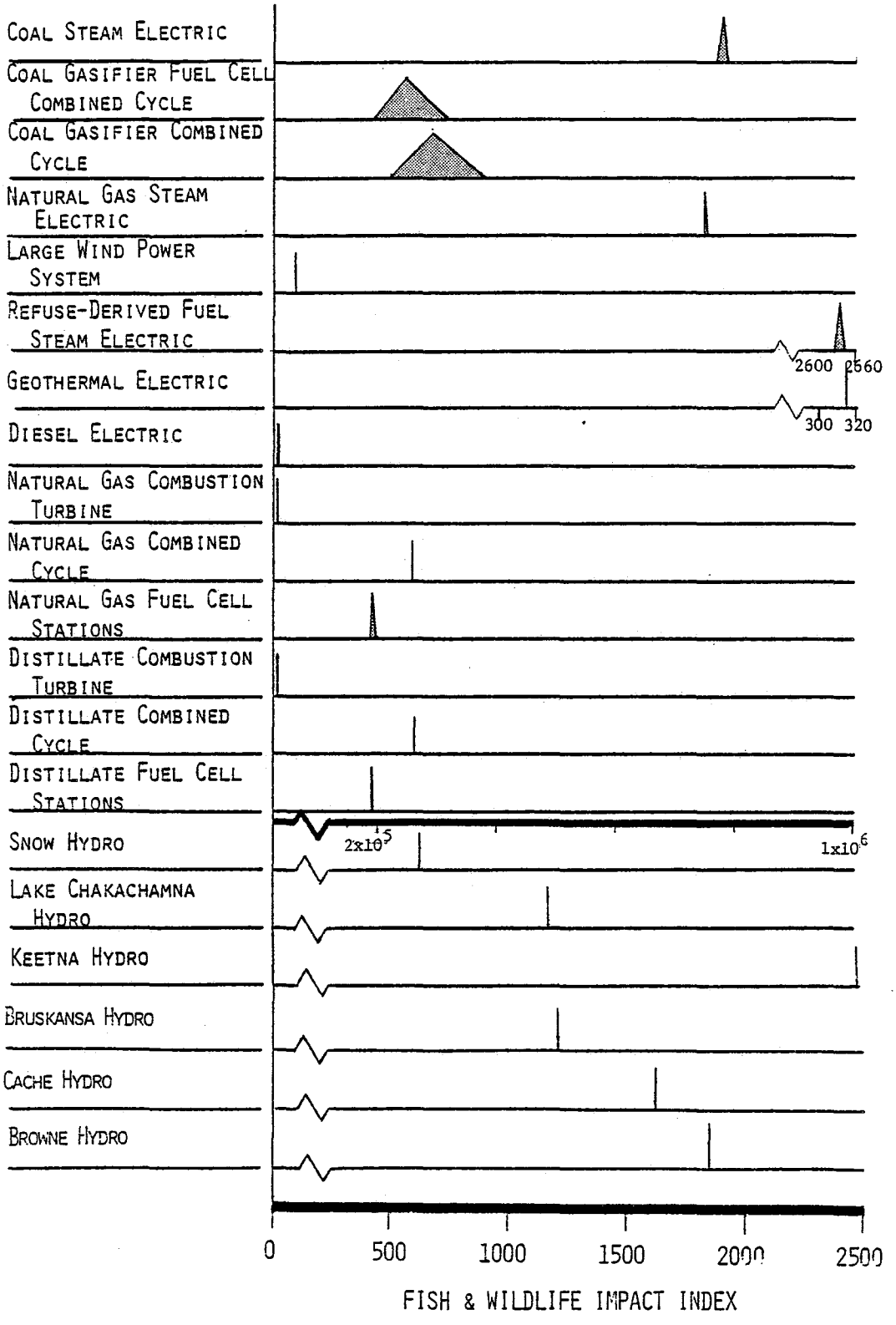


TABLE E-4. Estimated Performance of Alternatives - Impact on Fish & Wildlife



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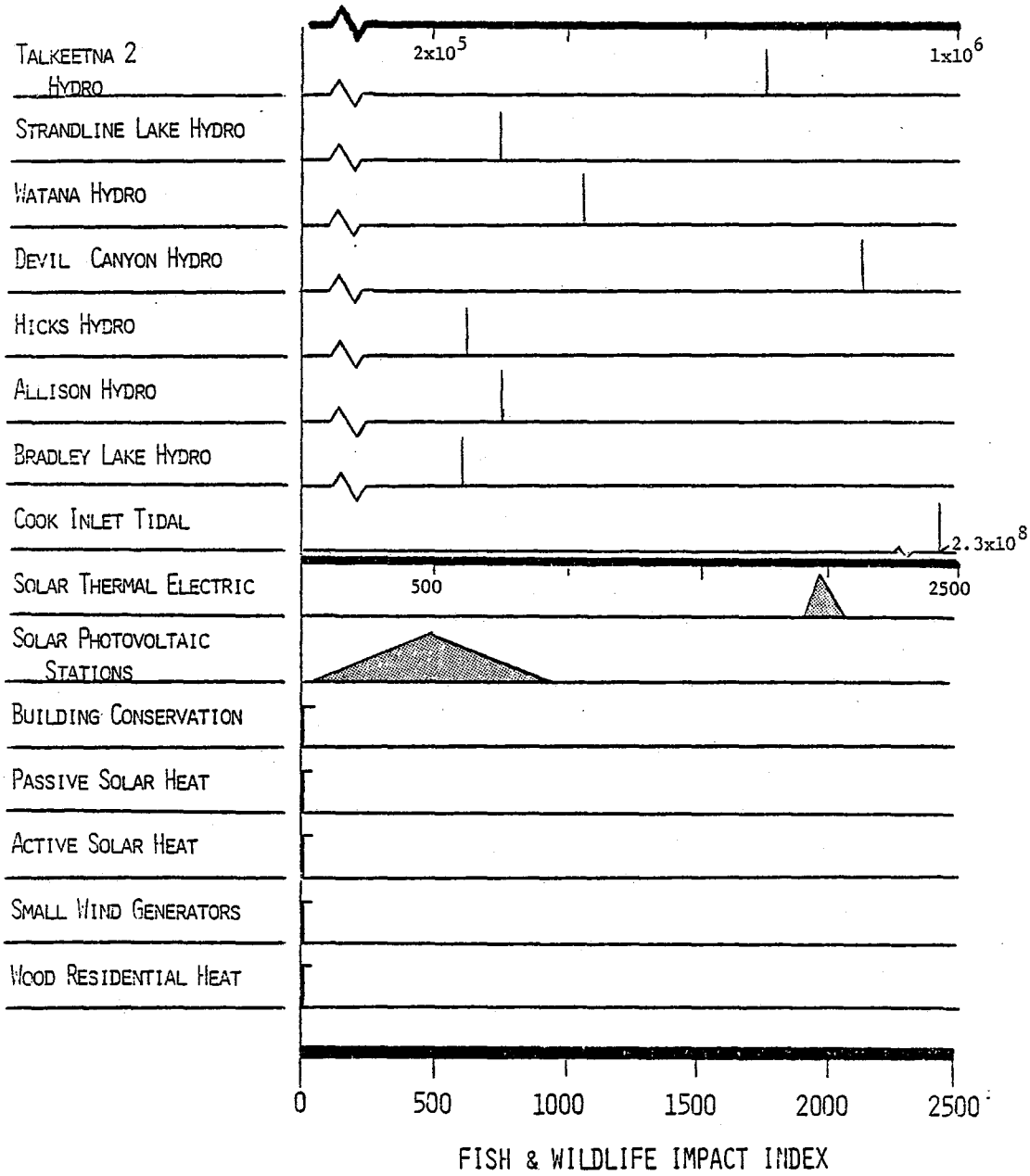
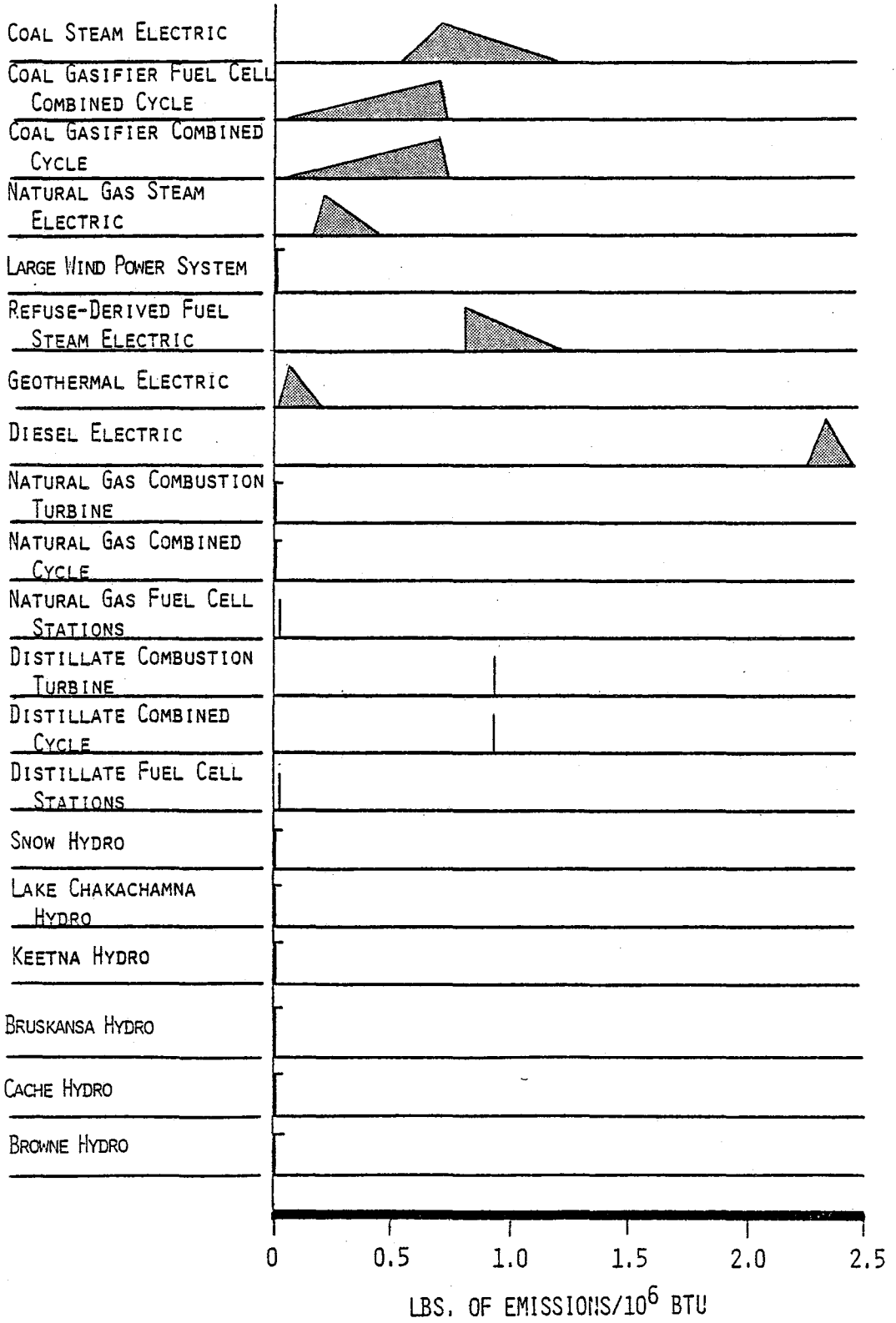


TABLE E-5. Estimated Performance of Alternatives - Air Quality



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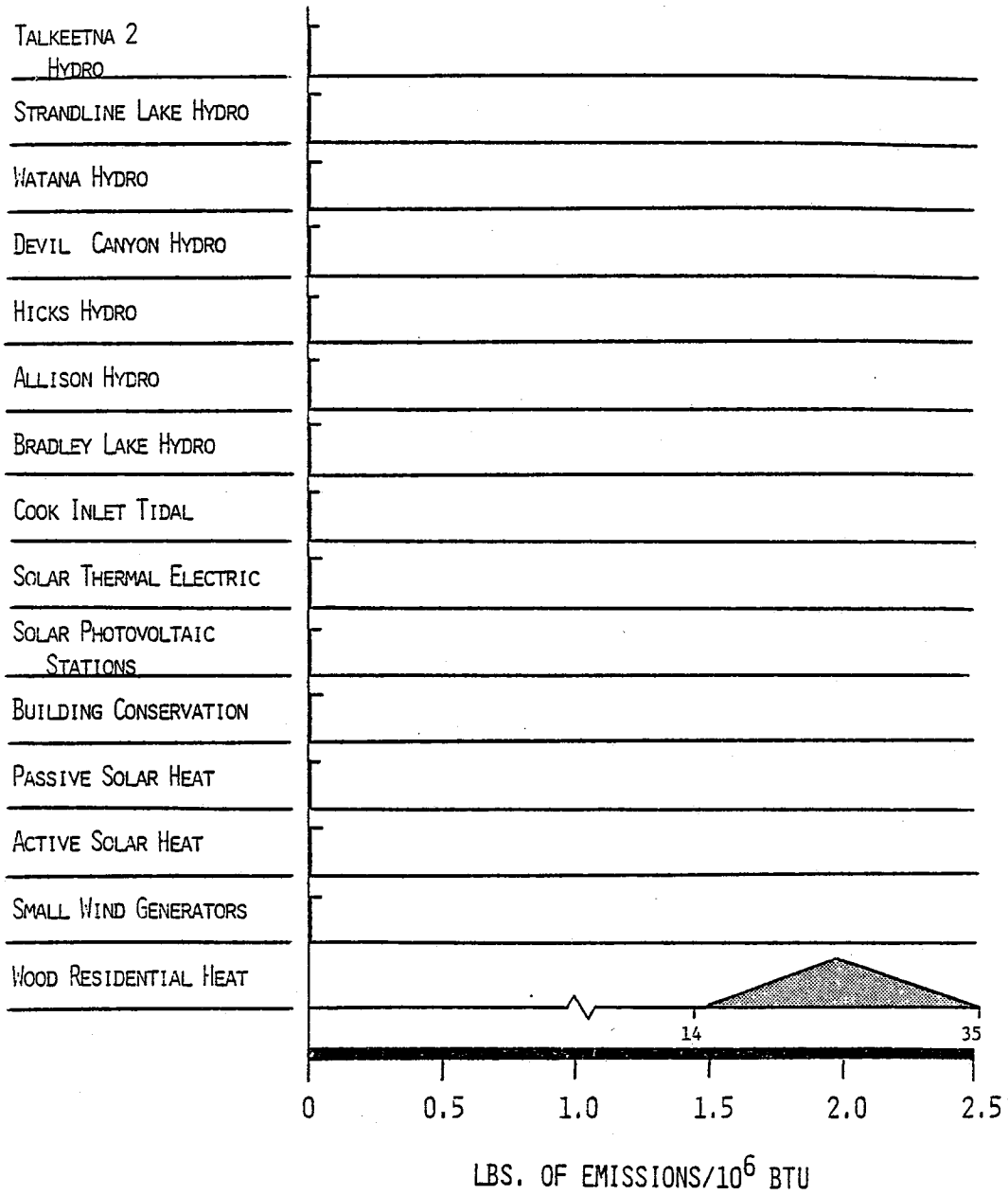


TABLE E-6. Estimated Performance of Alternatives - Potential Long-Term Health Effects

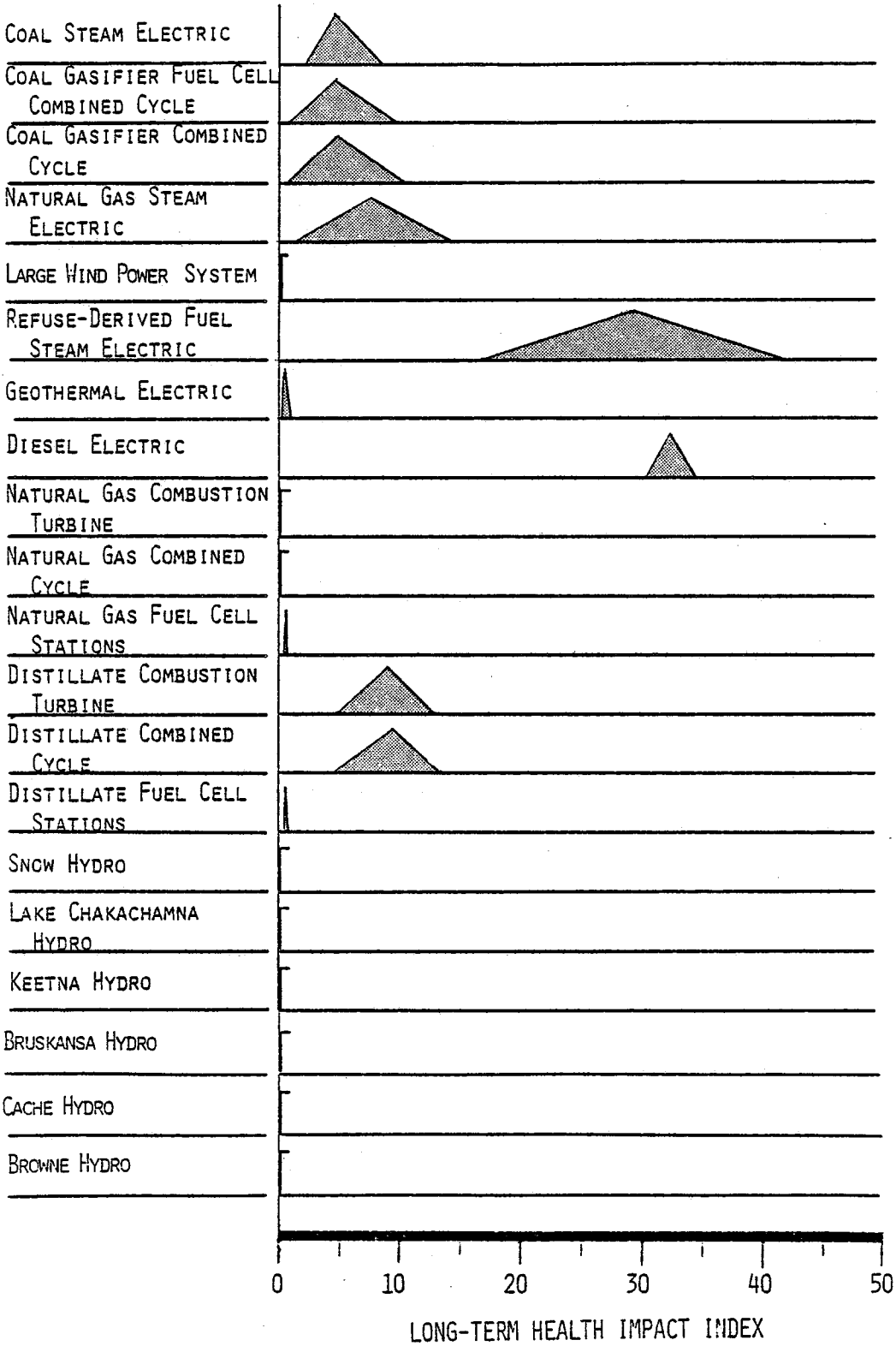


TABLE E-6. (contd)

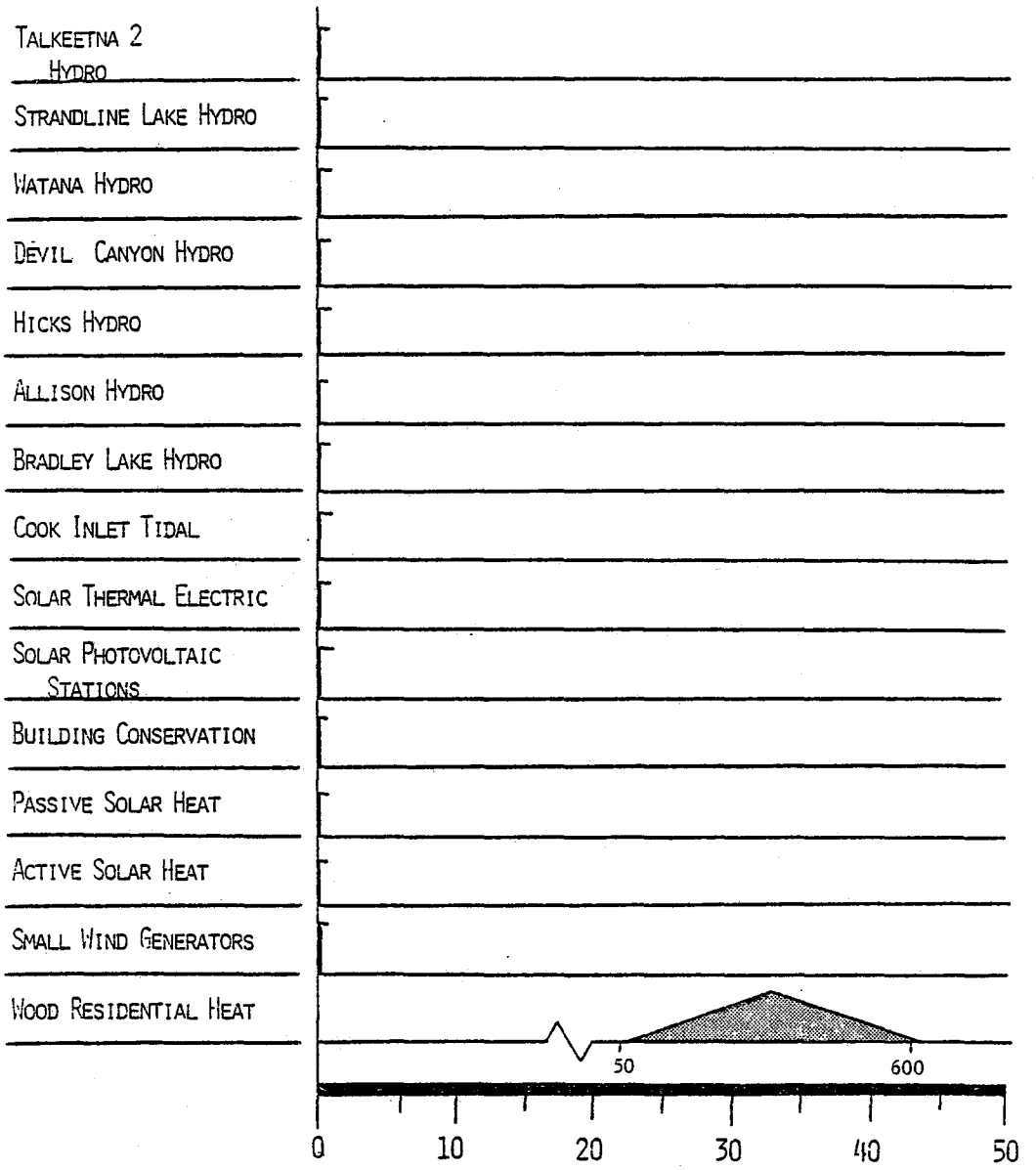
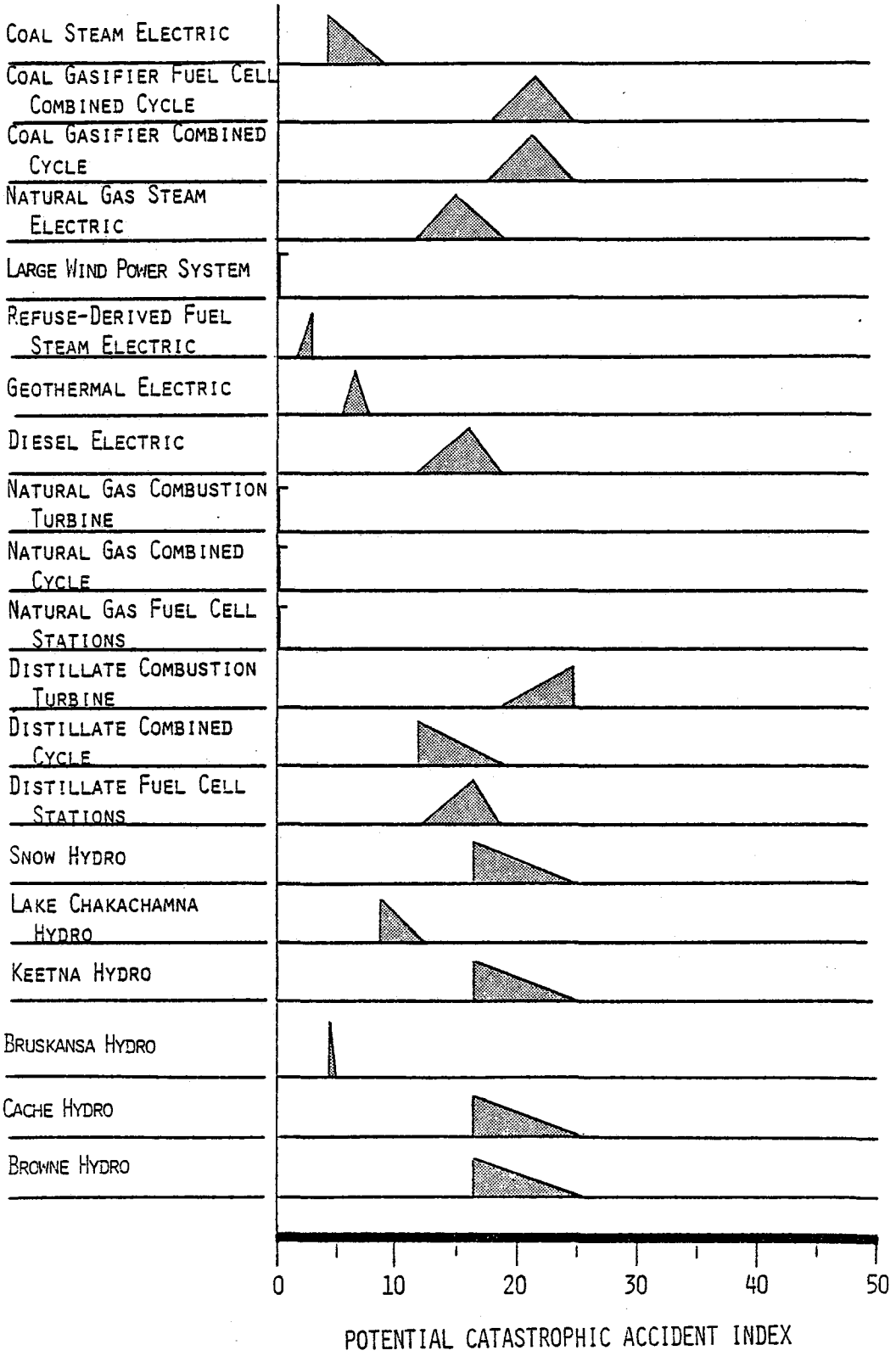


TABLE E-7. Estimated Performance of Alternatives - Catastrophic Accident Potential



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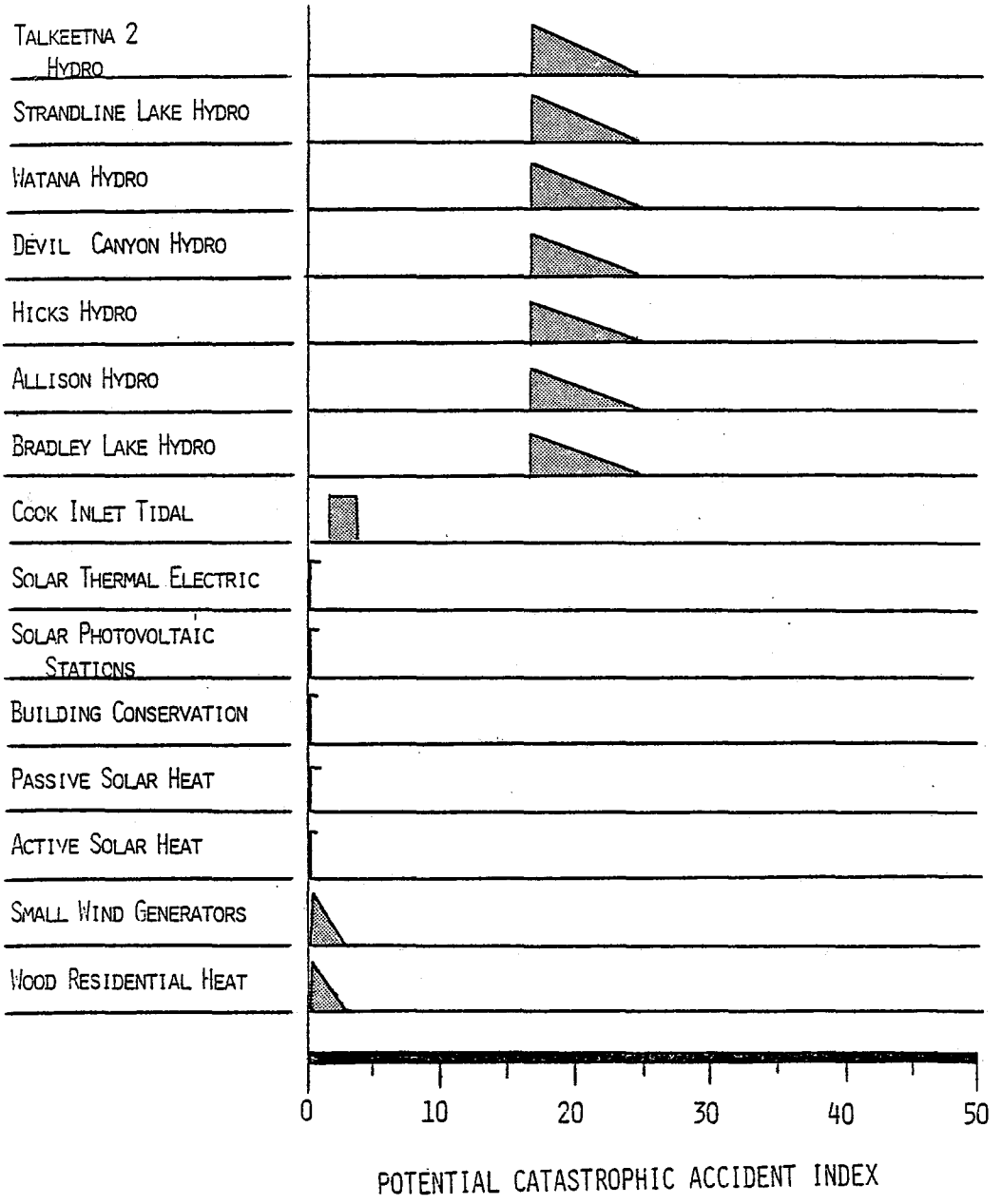
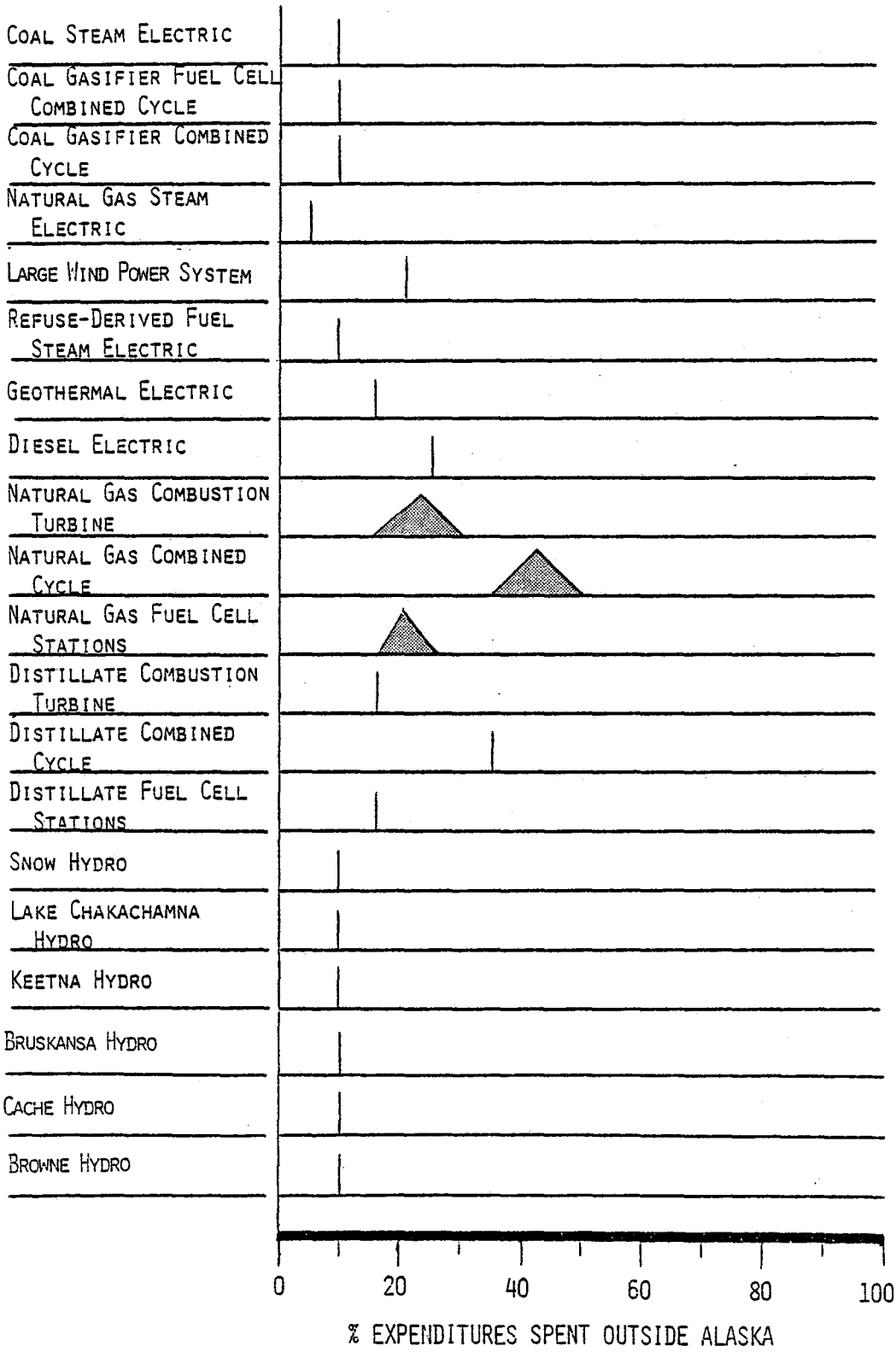


TABLE E-8. Estimated Performance of Alternatives - Potential for In-State Employment



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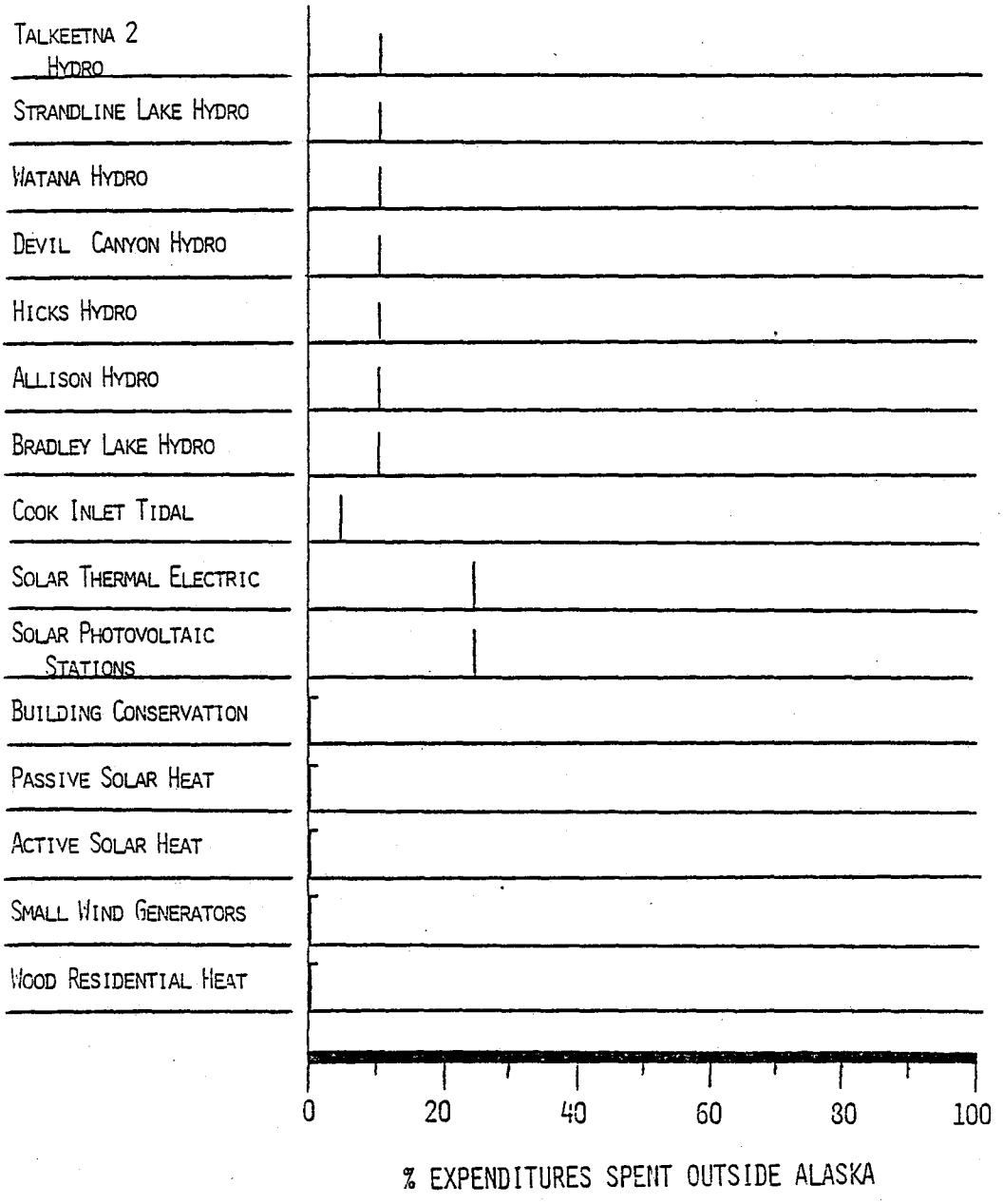
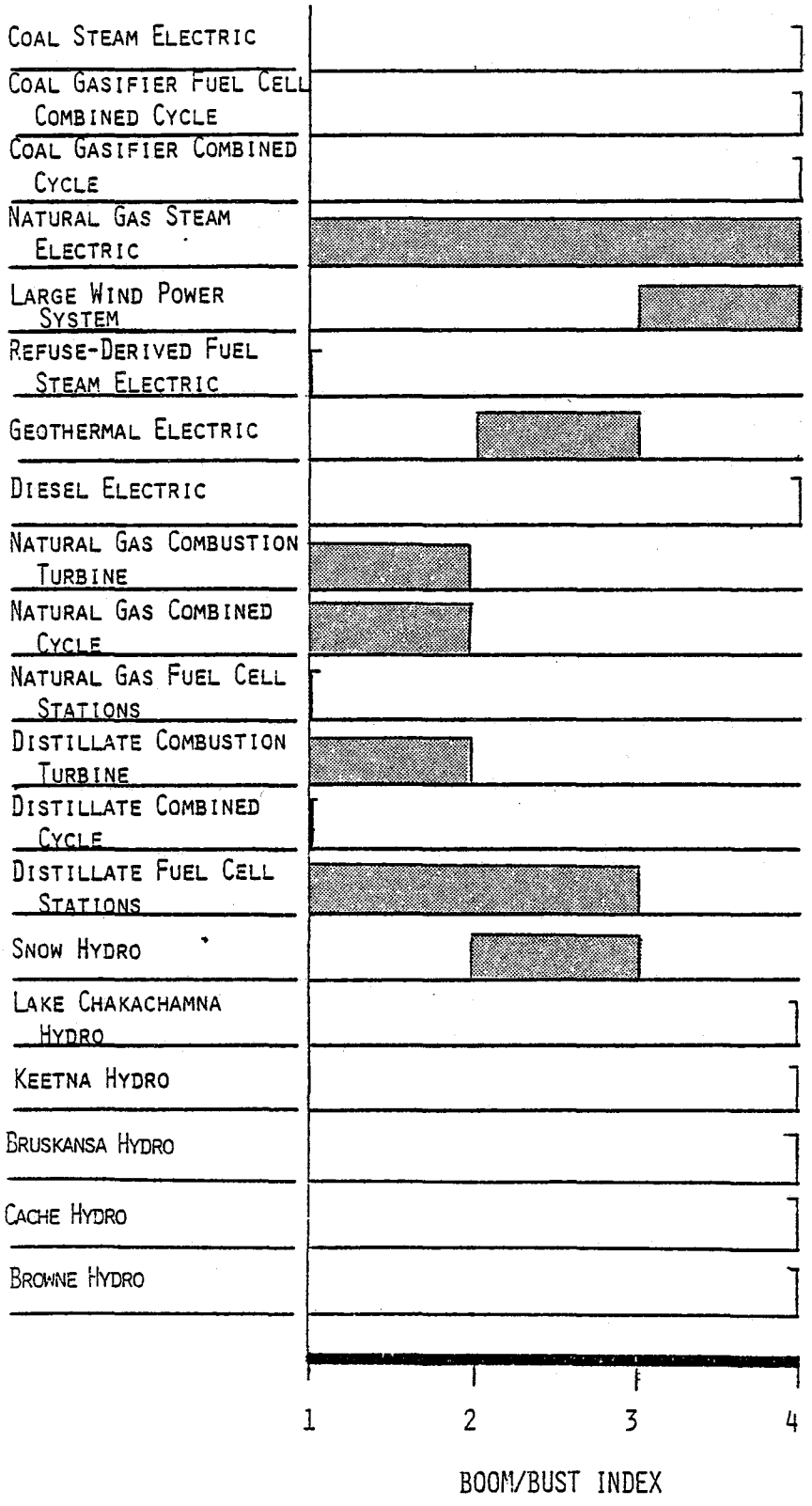


TABLE E-9. Estimated Performance of Alternatives - Social Boom-Bust Impacts



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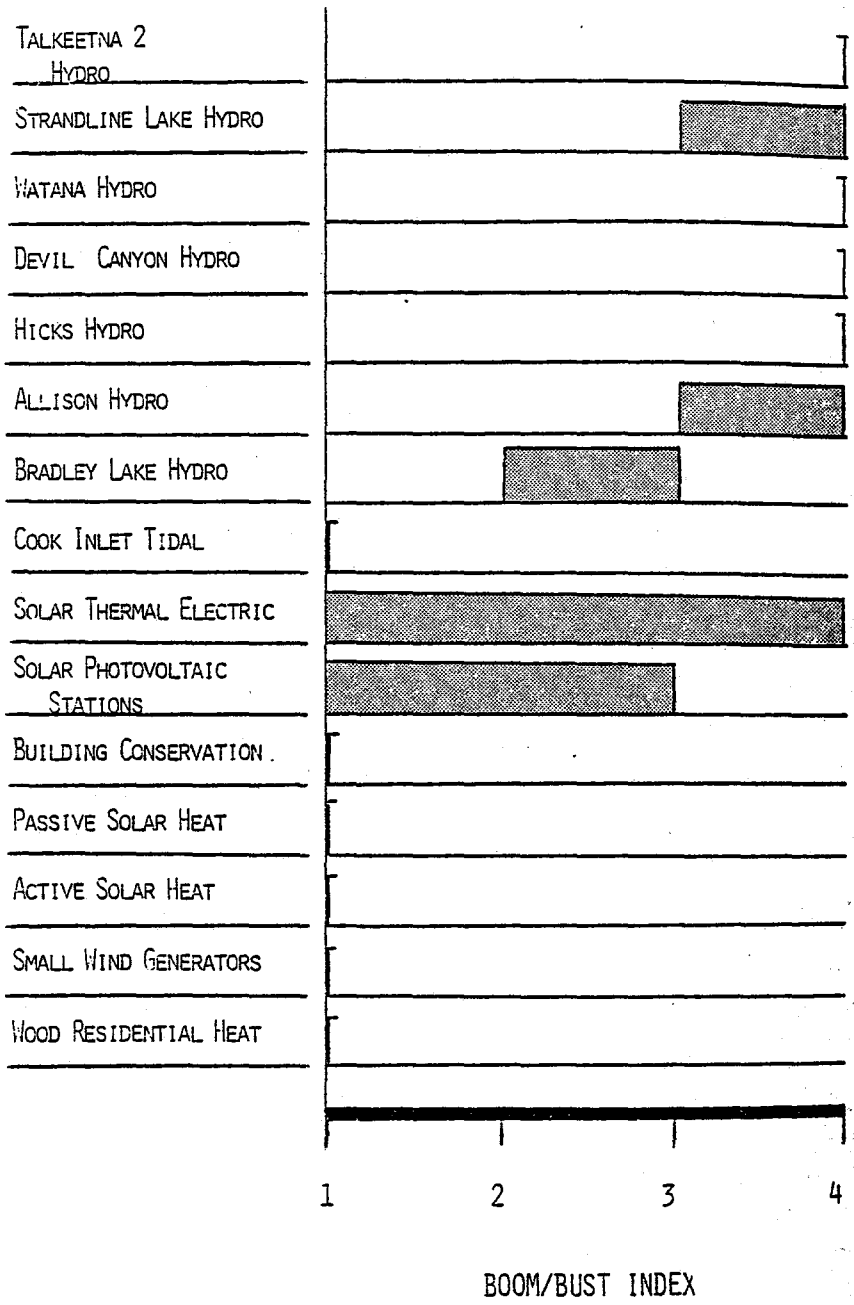
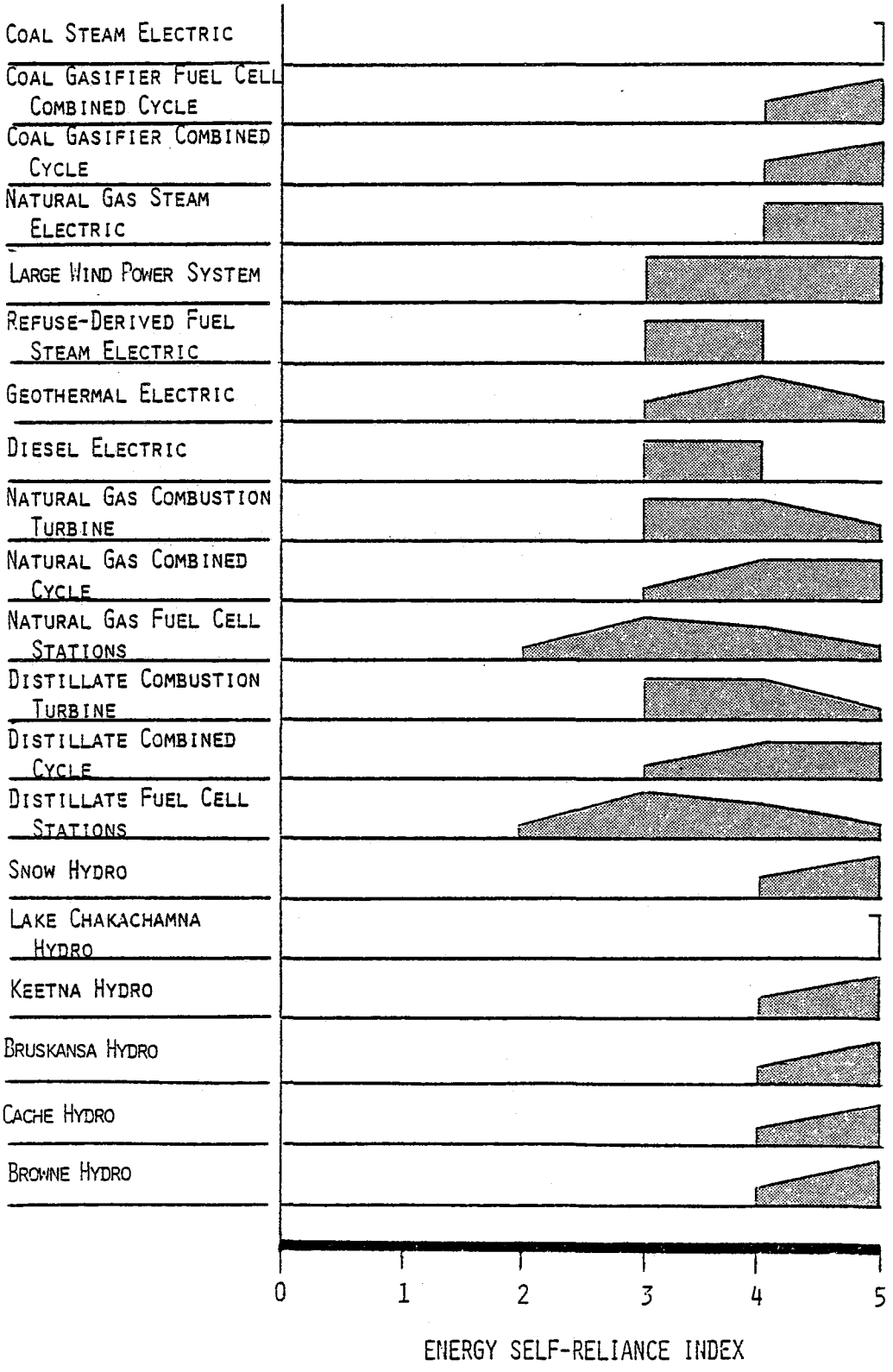


TABLE E-10. Estimated Performance of Alternatives - Potential for Individual's Self-Reliance



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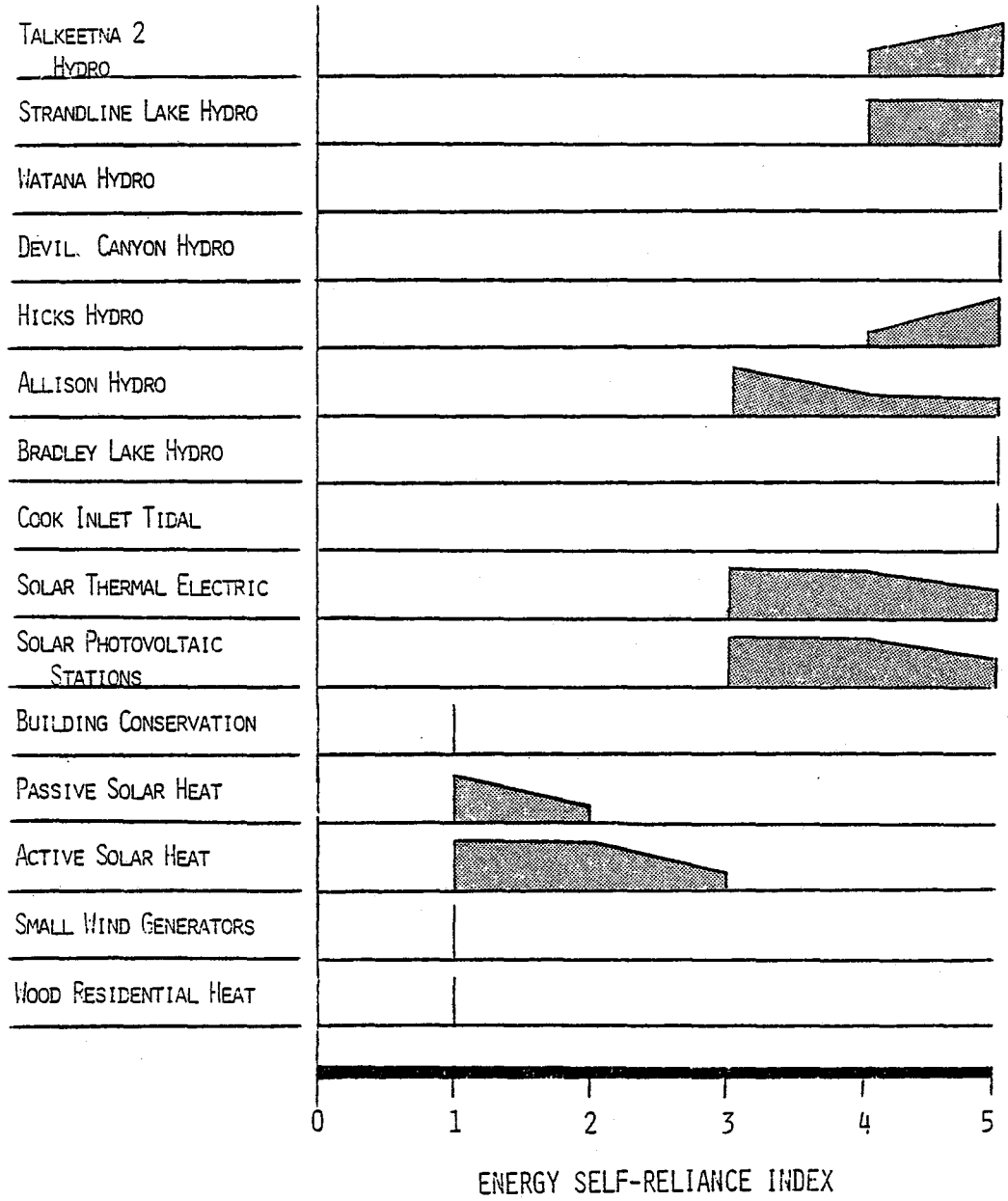

APPENDIX F

SURVEY RESPONDENTS COMMENTS

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SURVEY RESPONDENTS COMMENTS

The following is a list of the written comments received from individuals who completed Railbelt Electric Power Alternatives Study opinion survey. The list includes comments received at the May 1981 community meetings held in Anchorage, Fairbanks, Talkeetna and Soldotna and from the surveys mailed in subsequent to the meetings from the Fairbanks and Talkeetna areas.

ANCHORAGE COMMENTS

Decrease dependence on non-renewable resources especially those "imported" from outside Alaska.

Agree with several previous comments - strong consideration of forest and wildlife habitat protection, maintenance of natural resources important to Alaskans - aesthetic environment, clean air. Also decentralized power appears to be more secure from a national security standpoint as well as a safeguard against site specific geological-based dam failure.

Develop power in increments that meet conservative demand forecast.

The state should not promote development projects that would have substantial negative impacts on the fish and wildlife resources of the state, as recommended by the Fish and Game Department.

Thanks for asking my opinion.

Would not support tidal power at this time because I lack information on potential adverse environmental impacts. Do not bring nuclear fission to Alaska. Hydropower should concentrate on small and moderate-sized systems. Susitna proposal is too large and far reaching in environmental degradation.

General: Railbelt Electric Power Alternatives Study limits scope and, hence, utility of study; sources and uses must be matched.

Questionnaire design: in many cases it is impossible to respond; how can there be more than one (the) primary objective (Section A)? What is the difference between "indifferent" and "no opinion?" is this like a "firm maybe?"

Schedule - we need to do all we can to ensure timely development.

Perhaps under the conservation alternative, flex-time (flexible scheduling of work time) could be considered to help level out peak load times.

Why are you guys and gals weak on load-management options when they can be so significant!!

If you guys don't hit load management and peak-pricing (and other pricing mechanisms) first you are missing the boat.

I anticipate that hydro will be one of the major electricity sources finally selected. This study should compare site specific environmental costs and merits in evaluating one hydro project against another. For example, combinations of Lake Chakachamna + Bradley Lake + other hydro versus Susitna.

Several of the "alternatives" mentioned herein have not been demonstrated to be viable alternatives - for example conservation could reduce energy requirements but is clearly not an alternative to any energy.

Producing a solid power base is most important to an economic base. The only method to achieve this necessary requisite is large hydro. Get with the program and build Susitna.

Providing reliability and near-future needs should be emphasized. Pursuit of small projects should be deemphasized and emphasis should be put on meeting the needs that will be created as existing gas-fired and oil-fired equipment reaches useful life and utilities are faced with replacement costs which could be offset by firmly pursued large-scale projects.

I think building the two proposed Susitna hydro dams would be a waste of money and would have many adverse effects on the environment as well as very costly.

Your study should investigate "wind spots" as potential larger(r) scale wind power sites, despite lack of current data on these sites.

Better education in natural sciences in Alaska so that energy can be properly understood in those economic and political issues for which this survey is made.

Answers to all these questionnaires should not be construed to apply outside Railbelt area. I believe this questionnaire will not yield useful information: question B "points" is pointless.

My stance can be summed as follows: provide a safe reliable source of energy at least cost providing Alaskan self sufficiency at minimal environmental impact - it is immaterial what technological scheme is utilized.

Question 12 of Section A is badly structured.

I do not agree with large-scale development of hydro power as envisioned at this time by the Alaska state government. I strongly believe that more study is necessary to make an educated decision on this issue.

Wind, solar, wood, geothermal, and other small-scale technologies are important but should not preclude the development of large-scale hydro that will bring hydro power to the Railbelt for years to come. Small scale and conservation are personal things. They should be important but they are definitely in second place.

I do not think Alaska should develop large-scale hydro power at this time. We can meet our increased demands through use of alternative energy - solar, wind, small-scale hydro, etc.

Let the people have what they want. People in urban areas (Anchorage and Fairbanks) prefer centralized large-scale power production. Smaller communities (Talkeetna, Hope, Cooper Lake) do not want to be controlled by outsiders. They want local control and therefore want decentralized, small-scale local resources used to generate power.

Energy alternatives that could meet future needs but not encourage excessive future industrial development should be emphasized.

Balanced resources competitive sources all under PUC.

I feel very strongly that there should not be one primary objective most of the objectives are worthwhile and should be considered. I feel uncomfortable with this questionnaire.

This is a very poorly worded survey!!

Pay people for completion of this form.

FAIRBANKS COMMENTS

I think that the actual test should first be a fair economic evaluation. Secondly, the resource options should be based on a matrix of important issues that pertain to environment, self-sufficiency for Alaska, society and social impacts as based on public opinion and review of same by technical modeling.

As long as utilities are expected to have sufficient reserve capacity for all consumers at all times, small-scale projects will not replace a renewable, non-polluting source of generation for utilities.

The cost and quantity of power should permit the use of electricity for home heating.

In general, I agree with Question 10, Section A, but EPA requirements which make further coal generation at Healy impossible are stupid.

I just don't know enough about the practicality of tidal, wind, solar and geothermal to vote.

Part B - public safety. Of course, a dam shouldn't collapse with catastrophic damage - but I'm confident that Susitna, if built, will not. I do not oppose building bridges because occasionally one collapses.

Check into a scenario of using natural gas until alternate technologies such as fuel cells become available.

Combination of conservation and duplication of solar, goethermal wind and small hydro is goal. Present high-energy costs are incentives. Reducing use of nonrenewables can 1) make resources last longer 2) reduce environmental impacts. Creating jobs, reducing boom-bust potential, etc., would tend to follow.

Reword question 8, Section A.

I do not think the Susitna Dam should be built.

A primary objective should be equal benefit to rural as well as urban and bush communities.

I think this poll of opinions is poorly organized, confusing and ambiguous.

Small-scale alternatives are best.

The major Alaskan power needs are for home heating - not necessarily electric power.

TALKEETNA COMMENTS

My opinion is to keep the Alaskan environment as clean and unencumbered as possible. The alternative energy study aspect for finding a possible alternate for energy is really the only way worth going. To find another source more suitable for all concerned than the hydro dam will be well-received in this area. Wind and solar in my opinion are the way we should go!

My main objective is to promote energy development that has the least impact on the environment. We are an electric nation and need electricity but we must preserve our natural resources.

Solar - 2 actual data graphs and 3 swags. Guessing! Hydro is the only way to go. Only question is scale.

The state is ready to fund large-scale electric generation while many residents will realize no benefits due to the high cost of distribution of that electricity.

What about the effect on people's lifestyle? Do we have the alternative of saying "no alternative?" If so, I so say!

I'm against hydro - due to salmon runs - we can look to Oregon and Washington and see the problems there. I can foresee this same problem with tidal, but hopefully it can be worked on. Do we really need power so badly to destroy the peat and animals and plants involved. I believe most of this power that is so-called 'needed' is not for Alaska, but for the outside. This has already been shown in the plan in this year's legislature. In fact, your company is based in Washington. I'd like to see more solar, wind, etc., used in combinations. Not all people living in the Railbelt area want electric power. Lifestyle is important.

The go/no-go decision for the Susitna dam FERC application should be pushed back until Battelle can adequately investigate all the alternatives or combinations thereof so that we the people will receive an informed and aware reply/decision.

I believe that refuse burning not only solves local generation problems and demands as well as accommodating conservation and supply problems.

Demand should create supply and not supply create demand.

Rather than Susitna hydro - why not another set of viable hydro alternatives along with other alternatives - refuse, etc.

A favorable rate of interest on small, energy efficient, owner built homes would be a good incentive for the people of Alaska.

Minimize adverse effects on residents of the Railbelt area who do not utilize electrical power.

Being a nonconsumer of electrical energy I do not want to have my life changed negatively because someone in Anchorage wants lower rates. No Susitna Dam and no Intertie, please!

I'm greatly opposed to the Susitna Dam Project on many grounds and would like to see an alternative to hydro power used. Your last meeting in Talkeetna would have been of great interest to me. However, living north of Talkeetna in the bush I was unaware of this meeting, as many of my neighbors. Most people of this area are also opposed to the Susitna Dam project and would have had many worthwhile opinions and comments to express. May I suggest that in order that the opinions of concerned citizens be heard that you find some means of notifying the public of your meetings. Possibly, you could send notices to boxholders informing them of such meetings a few weeks in advance. Also, I would like to request to be on your mailing list to receive any literature.

I feel that an alternative to hydro power would be more beneficial in protecting our environment and the public health and safety. Continual rape of our environment in the name of "progress" will only contribute to unreparable damage for generations to come!

One of the primary objectives should be protection of Alaskan life style and scenic quality along areas where people make a living in the tourism industry and subsist on our land.

Local use of large-scale alternatives like wind or hydro for small communities with an accent on local.

Please make public the date of your meetings one month prior as many interested people live in the bush and communication takes longer.

One of the primary objectives should be the existing needs of the people who do not rely on any existing or proposed power influx.

One of the primary objectives should be tourism.

I find that this form is misleading and its about time to start thinking about the real power potential that is available and renewable that also is acceptable to the life style that we now enjoy!

Should concentrate on small-scale self-sufficiency for localized areas.

The dams and the power lines are totally unnecessary for the area. It is just a scheme that will destroy our river and woods for people in Fairbanks, so they can heat electrically in Fairbanks when its -60 degrees instead of heating with wood like most around here do. Acres American may think their dams and wires blend in with the woods, but they definitely don't.

It does not make sense to become dependent on one central power source. Small scale is the only responsible choice.