DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

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FOREIGN-TRADE ZONE DIVISION
Pier 2, Honolulu, Hawaii 96813
LAND USE DIVISION
PLANNING DIVISION
RESEARCH AND ECONOMIC ANALYSIS DIVISION

OFFICES
ADMINISTRATIVE SERVICES OFFICE
INFORMATION OFFICE

Ref. No. 2360

July 28, 1986

RECEIVED
86 JUL 29 P4:20
DIV. OF WATER & LAND DEVELOPMENT

MEMORANDUM

TO: Mr. Manabu Tagomori, Division Head
Water and Land Development Division
Department of Land and Natural Resources

FROM: Takeshi Yoshihara

SUBJECT: Study to Integrate Development of Hawaii's Renewable Energy and Water Resources

Attached for your review and evaluation is a copy of each of the four proposals received in response to the RFP for subject study. I have also attached a copy of the evaluation sheet I propose to use.

Please call me at extension 4150 when you are ready to meet to recommend a consultant.

TY/GOL:lta

Attachments

REQUEST FOR PROPOSALS

STUDY TO INTEGRATE DEVELOPMENT
OF HAWAII'S RENEWABLE ENERGY AND WATER RESOURCES

June 19, 1986

This is to invite your proposal to conduct a study to integrate the development of Hawaii's renewable energy and water resources.

Attached for your information and use is a brief description of the purpose and scope of the study that we wish to undertake. We would appreciate any questions concerning this request for proposal be addressed in writing to:

Dr. Takeshi Yoshihara
Energy Division
Department of Planning and Economic Development
335 Merchant Street, Room 108
Honolulu, Hawaii 96813

Please note that proposals are due on or before July 21, 1986, addressed to the Director of Planning and Economic Development.

Kent M. Keith

REQUEST FOR PROPOSALS

STUDY TO INTEGRATE DEVELOPMENT OF
HAWAII'S RENEWABLE ENERGY AND WATER RESOURCES

The State of Hawaii's Department of Land and Natural Resources (DLNR) and Department of Planning and Economic Development (DPED), hereinafter referred to as the "State," invite proposals to conduct a preliminary investigation of the technical and economic feasibility of developing Hawaii's renewable energy resources in conjunction with the development of the State's water resources.

Three copies of the proposal are due on, or before 4:00 p.m., HST, on Monday, July 21, 1986. The proposals shall be sent or delivered to:

Mr. Kent M. Keith, Director
Department of Planning and Economic Development
c/o Energy Division
335 Merchant Street, Room 110
Honolulu, Hawaii 96813

The total funds anticipated for this study are $50,000.

BACKGROUND

The Senate of the Thirteenth Legislature, 1986, adopted Senate Resolution No. 187, S.D. 1 (copy attached), which requested that DPED and DLNR jointly investigate the technical and economic feasibility of developing Hawaii's renewable energy resources in conjunction with the development of the State's water resources. The resolution noted that the cyclic nature of utility power requirements can result in large quantities of surplus power from renewable energy systems that could be used for water development such as desalination, pumping, storage and irrigation.

Geothermally-produced electricity on the Island of Hawaii is an example of the type of project that could combine alternate energy with water

resource development. Currently under development is a 500-megawatt cable which is intended to transmit electricity from the Big Island to Oahu via Maui. However, the current and anticipated needs on the Island of Oahu will not permit the continuous utilization of 500 MW. Generally speaking, it is undesirable to vary the output of fluids from geothermal wells in order to vary the production of electricity from a geothermal power plant. Thus, there will be periods in which geothermally-produced electricity on the Big Island will be in excess of the needs of Oahu.

Excess electricity could be used for the development of water supplies such as through desalination, pumped-storage, deep-well pumping and other approaches. For example, electricity during "off-peak" demand periods could be used to pump water from the rainfall-rich windward side of the Big Island to a reservoir(s) located, for instance, in the saddle between Mauna Kea and Mauna Loa. The stored water could be released to a hydroelectric generating plant at times when electricity is needed and its value is highest. The water would then be distributed for irrigation and possible other purposes in the more arid areas of the Big Island.

Opportunities for water development may also arise from use of electricity generated from other renewable energy sources, and may be considered as well on Maui and Oahu where terminals of the cable system are provided.

OBJECTIVE

The objective of the requested investigation is to determine the economic and technical feasibility of combining renewable energy and water resources development in Hawaii. An economic and technical assessment of water resource needs and potential alternate energy availability to fill these

needs is needed. Finally, more detailed conceptual plans are needed for several of the more promising opportunities to illustrate how natural energy and water resource development can be effectively combined.

SCOPE OF WORK AND MINIMUM REQUIREMENTS OF THE STUDY

It is intended that this study focus on the Big Island and be completed in one phase.

Using available information, the selected consultant shall determine the economic, technical and environmental feasibility of combining renewable energy development and water resource development in Hawaii. This will consist of a general assessment of potential water resource needs; a comparative analysis of various means to develop water resources through such means as pumped surface water, pumped wells, mass storage, and desalination; an assessment of the renewable energy, by resource, that might be available for water development; and an identification of potential projects ranked by technical and economic feasibility of integrating the use of electricity produced from renewable energy resources with water development. This generic study shall also address the timeframe of the developments.

In conjunction with the State, the selected consultant shall then prepare more detailed conceptual plans for no less than two specific projects on the Big Island that could integrate renewable energy with water resource development. These plans should include quantities of water involved, source of water, source and availability especially during off-peak hours of renewable energy, economic analysis, and potential permitting, institutional, environmental and social issues. One of these specific projects shall be the use of off-peak geothermally-produced electrical energy on the Big Island as discussed in the Background above.

PRODUCTS

1. The selected consultant shall submit two draft copies of the final report, in any reasonable format, for review by the Government.
2. After review and approval by the Government, the consultant shall provide one unbound camera-ready copy and five bound copies of the final report, all on 8-1/2" x 11" paper.

PROPOSAL CONTENT

All proposals are to contain, but not to be limited to, the following information:

1. A description of the project organization and management, including relationships among the proposed project team members, proposed subcontractors, and project director.
2. A general statement of qualifications identifying the breadth and depth of capabilities of the firm applicable to this proposal. This statement should be supported by resumes of key personnel that would participate in the investigations. Sub-contractor arrangements should be clearly identified and qualifications described in similar fashion.
3. A detailed statement of the scope of the proposed services including a statement of understanding of the project and how the proposed scope will accomplish the studies, purpose and objectives. A statement should also be included as to how the work tasks will be accomplished; i.e., technical procedures, data collection and evaluation and specific personnel assignments.
4. Information and/or assistance which would be required by the firm from the Government. See "Government Will Provide" section.

5. A project schedule, which indicates the suggested start and completion dates for the principal sections of the work plan. Major milestones and suggested intervals before interim and final reports should also be included. The schedule should be stated in terms of days or weeks after the date the consultant is advised by the Government to proceed.
6. The proposal shall be signed by an individual authorized to bind the offeror and shall contain a statement that the proposal is a firm offer for a thirty day (or more) period.
7. The proposal shall also provide the following information: name, title, address, and telephone number of an individual who may be contacted during the period of proposal evaluation and with authority to negotiate and contractually bind the company.
8. Provide total proposed budget for the study by major budget categories showing direct costs (salaries, fringe benefits, travel, per diem, etc., and all other costs associated with the services provided); indirect costs and overhead; profit; and State excise tax. Indicate the estimated number of professional man days that will be devoted to each major work task. Indicate preferred payment schedule.

CONSULTANT SELECTION PROCEDURES

1. Only proposals received on or before the stated deadline for receipt of proposal will be considered.
2. Proposals which do not fully comply with the "Proposal Content" will not be further considered.
3. An evaluation committee will be formed by the Government to evaluate each proposal.

4. If deemed essential, the evaluation committee may conduct personal interviews with potential consultants.
5. Final consultant selection for work scope and fee negotiations will be made by the State Director of Planning and Economic Development with the concurrence of the Chairman of Land and Natural Resources.
6. The Government reserves the right to reject all proposals.

GOVERNMENT WILL PROVIDE

1. Upon request of a prospective respondent, clarification of matters concerning this RFP will be provided by the State.
2. Upon request of the selected consultant, the State will confer with the consultant to indicate where specific background information may be found.
3. The State will review and comment on the selected consultant's choice of specific projects to undergo preliminary planning.
4. The State will review and comment on consultant's draft final report.

CRITERIA FOR EVALUATION OF PROPOSALS

Each eligible proposal will be evaluated in accordance with the following:

1. Consultant's approach to the study (scope of work), based on how well the tasks provide for a logical and comprehensive approach arriving at the desired results and/or objectives of the study.
2. The consultant's knowledge of the water resource needs and renewable energy development in Hawaii.
3. The consultant's past experience in similar studies as described in the minimum requirements of the study.

4. The qualifications of consultant's key personnel who will be involved in the survey.
5. The proposed budget for the study, in terms of total cost to the Government, and proposed expenditures.

THE SENATE
THIRTEENTH LEGISLATURE, 1986
STATE OF HAWAII

S.R. NO. 187 S.D. 1

SENATE RESOLUTION

ENCOURAGING THE JOINT DEVELOPMENT OF HAWAII'S RENEWABLE ENERGY AND WATER RESOURCES.

WHEREAS, the policy of the State is to accelerate the development of its energy and water resources; and

WHEREAS, Hawaii is richly endowed with renewable energy resources which can be used effectively for the development of the State's water resources; and

WHEREAS, the development of intermittent renewable energy resources in the State for distribution by the utility is limited to approximately 10-20 percent of the power on the line and varies with load conditions; and

WHEREAS, meeting the total energy needs of the State will require large scale renewable energy development, including the means for transporting power from one island to another; and

WHEREAS, the cyclic nature of utility power requirements can result in large quantities of surplus power from renewable energy systems being rejected and wasted; and

WHEREAS, the use of excess electricity for water development such as desalination, pumping, storage and irrigation, can greatly expand the potential for development of renewable energy resources; and

WHEREAS, excess power can be stored in a pump-storage system by using it to pump water from a lower to a higher elevation during off-peak demand periods, and the power recovered by water flowing through a turbine to a lower elevation during peak demand periods, resulting in the recovery of 65 to 75 percent of the power initially used and in the transport of water from one region to another; and

WHEREAS, excess power can also be used directly to desalinate water; and

WHEREAS, increased availability and use of fresh water can result in expanded opportunities for beneficial agricultural, industrial and urban use of lands to the economic benefit of the people of Hawaii, and result in expanded development and more efficient utilization of the State's renewable energy resources; now, therefore,

BE IT RESOLVED by the Senate of the Thirteenth Legislature of the State of Hawaii, Regular Session of 1986, that the Department of Planning and Economic Development and the Department of Land and Natural Resources jointly investigate the technical and economic feasibility of developing Hawaii's renewable energy resources in conjunction with the development of the State's water resources; and

BE IT FURTHER RESOLVED that certified copies of this Resolution be transmitted to the Director of Planning and Economic Development, the Chairperson of the Board of Land and Natural Resources, and to other agencies of the State and County responsible for energy and water developments.

STANDING COMMITTEE REPORT NO. 1121-86

Honolulu, Hawaii

APR 18, 1986

Honorable Richard S. H. Wong
President of the Senate
Thirteenth State Legislature
Regular Session of 1986
State of Hawaii

Sir:

RE: S.R. No. 187

Your Committee on Energy, to which was referred S.R. No. 187 entitled:

"SENATE RESOLUTION ENCOURAGING THE JOINT DEVELOPMENT OF HAWAII'S RENEWABLE ENERGY AND WATER RESOURCES",

begs leave to report as follows:

The purpose of this resolution is to request the Department of Planning and Economic Development and the Department of Land and Natural Resources to jointly investigate the technical and economic feasibility of developing Hawaii's renewable energy resources in conjunction with the development of the State's water resources.

Your Committee finds that the use of excess energy for water development, such as the use of energy technologies for desalination purposes, and for a pump-storage-water distribution system would greatly expand the potential for development of renewable energy resources. Renewable energy resources in the future may yield excess electrical power which could be generated and stored during periods of low demand and reapplied during the high demand periods for various economic uses.

Your Committee further finds that orderly development of such long-range objectives is consistent with the Hawaii State Plan which calls for a development of "dependable, efficient and economical statewide energy systems capable of supporting the needs of the people."

Your Committee has amended the resolution by correcting the reference to the Director of the Department of Land and Natural Resources to the Chairperson of the Board of Land and Natural Resources in the BE IT FURTHER RESOLVED clause.

1398E
S1872

Your Committee on Energy concurs with the intent and purpose of S.R. No. 187, as amended herein, and recommends its adoption in the form attached hereto as S.R. No. 187, S.D. 1.

Respectfully submitted,

RICHARD M. MATSUURA, Chairman

JAMES AKI, Vice-Chairman

GERALD T. HAGINO, Member

MARY-JANE McMURDO, Member

NORMAN MIZUGUCHI, Member

RICHARD HENDERSON, Member

W. BUDDY SOARES, Member

1398E
S1872

Consultant's Name _____

Evaluator's Name _____

EVALUATION SHEET FOR PROPOSALS
TO INTEGRATE HAWAII'S RENEWABLE ENERGY
AND WATER RESOURCES

CRITERIA	WEIGHT		SCORE		EXTENSION
1. Approach to the study. Supports work statement. Logical and comprehensive. Leads to desired objectives.	2	x	____ (0 to 10)	=	____
2. Knowledge of the water resource needs and renewable energy development in Hawaii.	3	x	____ (0 to 10)	=	____
3. Past experience in similar studies by firm.	2	x	____ (0 to 10)	=	____
4. Qualifications of consultant's project team.	2	x	____ (0 to 10)	=	____
5. Budget	1	x	____ (0 to 10)	=	____
6.					
7.					
				TOTAL:	____

FAVORABLE COMMENTS: _____

_____

_____

_____

_____

UNFAVORABLE COMMENTS: _____

_____

_____

_____

_____

DRAFT

REQUEST FOR PROPOSALS

STUDY TO INTEGRATE DEVELOPMENT OF
HAWAII'S RENEWABLE ENERGY AND WATER RESOURCES

The State of Hawaii's Department of Land and Natural Resources (DLNR) and Department of Planning and Economic Development (DPED), hereinafter referred to as the "State," invite proposals to conduct a preliminary investigation of the technical and economic feasibility of developing Hawaii's renewable energy resources in conjunction with the development of the State's water resources.

Three copies of the proposal are due on, or before 4:00 p.m., HST, on Monday, _____, 1986. The proposals shall be sent or delivered to:

Mr. Kent M. Keith, Director
Department of Planning and Economic Development
c/o Energy Division
335 Merchant Street, Room 110
Honolulu, Hawaii 96813

The total funds available for this study are $ 50,000 (DPED – $25,000 / DLNR-$25,000).

BACKGROUND

The Senate of the Thirteenth Legislature, 1986, adopted Senate Resolution No. 187, S.D. 1 (copy attached), which requested that DPED and DLNR jointly investigate the technical and economic feasibility of developing Hawaii's renewable energy resources in conjunction with the development of the State's water resources. The resolution noted that the cyclic nature of utility power requirements can result in large quantities of surplus power from renewable energy systems that could be used for water development such as desalination, pumping, storage and irrigation.

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4. Information and/or assistance which would be required by the firm from the Government. See "Government Will Provide" section.

5. A project schedule, which indicates the suggested start and completion dates for the principal sections of the work plan. Major milestones and suggested intervals before interim and final reports should also be included. The schedule should be stated in terms of days or weeks after the date the consultant is advised by the Government to proceed.
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GOVERNMENT WILL PROVIDE

1. Upon request of a prospective respondent, clarification of matters concerning this RFP will be provided by the State.
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1. Consultant's approach to the study (scope of work), based on how well the tasks provide for a logical and comprehensive approach arriving at the desired results and/or objectives of the study.
2. The consultant's knowledge of the water resource needs and renewable energy development in Hawaii.
3. The consultant's past experience in similar studies as described in the minimum requirements of the study.

4. The qualifications of consultant's key personnel who will be involved in the survey.
5. The proposed budget for the study, in terms of total cost to the Government, and proposed expenditures.

THE SENATE
FIFTEENTH LEGISLATURE, 1986
STATE OF HAWAII

S.R. NO. 187 S.D. 1

SENATE RESOLUTION

ENCOURAGING THE JOINT DEVELOPMENT OF HAWAII'S RENEWABLE ENERGY AND WATER RESOURCES.

WHEREAS, the policy of the State is to accelerate the development of its energy and water resources; and

WHEREAS, Hawaii is richly endowed with renewable energy resources which can be used effectively for the development of the State's water resources; and

WHEREAS, the development of intermittent renewable energy resources in the State for distribution by the utility is limited to approximately 10-20 percent of the power on the line and varies with load conditions; and

WHEREAS, meeting the total energy needs of the State will require large scale renewable energy development, including the means for transporting power from one island to another; and

WHEREAS, the cyclic nature of utility power requirements can result in large quantities of surplus power from renewable energy systems being rejected and wasted; and

WHEREAS, the use of excess electricity for water development such as desalination, pumping, storage and irrigation, can greatly expand the potential for development of renewable energy resources; and

WHEREAS, excess power can be stored in a pump-storage system by using it to pump water from a lower to a higher elevation during off-peak demand periods, and the power recovered by water flowing through a turbine to a lower elevation during peak demand periods, resulting in the recovery of 65 to 75 percent of the power initially used and in the transport of water from one region to another; and

WHEREAS, excess power can also be used directly to desalinate water; and

WHEREAS, increased availability and use of fresh water can result in expanded opportunities for beneficial agricultural, industrial and urban use of lands to the economic benefit of the people of Hawaii, and result in expanded development and more efficient utilization of the State's renewable energy resources; now, therefore,

BE IT RESOLVED by the Senate of the Thirteenth Legislature of the State of Hawaii, Regular Session of 1986, that the Department of Planning and Economic Development and the Department of Land and Natural Resources jointly investigate the technical and economic feasibility of developing Hawaii's renewable energy resources in conjunction with the development of the State's water resources; and

BE IT FURTHER RESOLVED that certified copies of this Resolution be transmitted to the Director of Planning and Economic Development, the Chairperson of the Board of Land and Natural Resources, and to other agencies of the State and County responsible for energy and water developments.

STANDING COMMITTEE REPORT NO. 1121-86

Honolulu, Hawaii

APR 18, 1986

Honorable Richard S. H. Wong
President of the Senate
Thirteenth State Legislature
Regular Session of 1986
State of Hawaii

Sir:

RE: S.R. No. 187

Your Committee on Energy, to which was referred S.R. No. 187 entitled:

"SENATE RESOLUTION ENCOURAGING THE JOINT DEVELOPMENT OF HAWAII'S RENEWABLE ENERGY AND WATER RESOURCES",

begs leave to report as follows:

The purpose of this resolution is to request the Department of Planning and Economic Development and the Department of Land and Natural Resources to jointly investigate the technical and economic feasibility of developing Hawaii's renewable energy resources in conjunction with the development of the State's water resources.

Your Committee finds that the use of excess energy for water development, such as the use of energy technologies for desalination purposes, and for a pump-storage-water distribution system would greatly expand the potential for development of renewable energy resources. Renewable energy resources in the future may yield excess electrical power which could be generated and stored during periods of low demand and reapplied during the high demand periods for various economic uses.

Your Committee further finds that orderly development of such long-range objectives is consistent with the Hawaii State Plan which calls for a development of "dependable, efficient and economical statewide energy systems capable of supporting the needs of the people."

Your Committee has amended the resolution by correcting the reference to the Director of the Department of Land and Natural Resources to the Chairperson of the Board of Land and Natural Resources in the BE IT FURTHER RESOLVED clause.

1398E
S1872

Your Committee on Energy concurs with the intent and purpose of S.R. No. 187, as amended herein, and recommends its adoption in the form attached hereto as S.R. No. 187, S.D. 1.

Respectfully submitted,

RICHARD M. MATSUURA, Chairman

JAMES AKI, Vice-Chairman

GERALD T. HAGINO, Member

MARY-JANE MCMURDO, Member

NORMAN MIZUGUCHI, Member

RICHARD HENDERSON, Member

W. BUDDY SOARES, Member

1398E
S1872