Alaska Energy Inventory | **FY2008 Request: $500,000**
Reference No: AMD43300

AP/AL: Appropriation
Category: Development
Location: Statewide
House District: Statewide
Estimated Project Dates: 07/01/2007 - 06/30/2007

Project Type: Planning

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Brief Summary and Statement of Need:

Inventory and compile all available Alaska energy resource data suitable for electrical power generation and space heating needs including natural gas, coal, coalbed and shalebed methane, gas hydrates, geothermal, wind, hydro, and biomass into a searchable GIS format with quantitative attributes. This data will be accessible through a user-friendly web-based interactive map with scalable layers to display the location, type, and where applicable, a risk-weighted estimate of quantity for energy resources available in a given area or site. The data will be used to identify locations or regions where the most economic energy resource or combination of energy resources can be developed to meet local needs.

Funding:	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	Total
Gen Fund	$500,000	$500,000	$350,000	$350,000	$250,000		$1,950,000
Total:	$500,000	$500,000	$350,000	$350,000	$250,000	$0	$1,950,000

☐ State Match Required ☐ One-Time Project ☑ Phased - new ☐ Phased - underway ☐ On-Going
0% = Minimum State Match % Required ☑ Amendment ☐ Mental Health Bill

Operating & Maintenance Costs:

	Amount	Staff
Project Development:	0	0
Ongoing Operating:	0	0
One-Time Startup:	0	
Totals:	0	0

Additional Information / Prior Funding History:

This is a new project request.

Project Description/Justification:

Alaska has considerable energy resources distributed throughout the state including conventional oil, gas, and coal, and unconventional coalbed and shalebed methane, gas hydrates, geothermal, wind, hydro, and biomass. While much of the known large oil and gas resources are concentrated on the North Slope and in the Cook Inlet regions, the other potential sources of energy are dispersed across a varied landscape from frozen tundra to coastal settings. Despite the presence of these potential energy sources, rural Alaska is mostly dependent upon diesel fuel for both electrical power generation and space heating needs. At considerable cost, large quantities of diesel fuel are transported to more than 150 roadless communities by barge or airplane and stored in large bulk fuel tank farms for winter months when electricity and heat are at peak demands. Recent increases in the price of oil have severely impacted the price of energy throughout Alaska, and especially hard hit are rural communities and remote mines that are off the road system and isolated from integrated electrical power grids. The high cost of energy for mineral extraction operations affects both the profitability of existing mines as well as the viability of new mines coming online, thereby reducing potential jobs in rural Alaska.

Even though the state has significant conventional gas resources in restricted areas, few communities are located near enough to these resources to directly use natural gas to meet their energy needs. Conventional natural gas from the production of the Alpine field on the North Slope will be utilized by the village of Nuiqsut. Renewed exploration in the Bristol Bay area and other regions may result in production facilities near existing communities or remote mine sites. Coal resources in Alaska are distributed over a wide area with identified coal resources (all ranks) totaling in excess of 160 billion short tons, and estimated hypothetical and speculative resources as high as 5.5 trillion short tons. The possibility of coalbed methane resources is restricted to communities situated on top of or near identified coal resources capable of generating and

sustaining methane gas production. Shalebed methane is currently being evaluated as an energy resource for the Red Dog Mine. Onshore gas hydrates in Alaska are restricted to the thick permafrost region of the North Slope. In Alaska, high-temperature geothermal resources that are capable of generating steam to run turbines to create electrical power are located along the Alaska Peninsula and Aleutian islands arc, an area of active volcanism. A belt of moderate- to low-temperature thermal springs extending across north-central Alaska and in Southeast Alaska can be utilized for direct use in central heating. Recent advances in technology have resulted in the development of small power generation units that can utilize moderate-temperature resources, including an experimental design recently installed at Chena Hot Springs. An array of wind turbine power generation and storage devices, currently in place at Kotzebue and a few other sites, can be utilized in other appropriate locations for renewable and conventional hybrid and distributed electrical power generation systems. Wind projects can help stabilize local energy prices and reduce the volume of fossil fuels needed to meet power generation needs. Communities situated near fast flowing or falling water, given the right economic conditions, have the potential to generate hydroelectricity from a renewable and nonpolluting resource. Biomass includes wood products and peat that can be used for space heating needs or utilized in a manner similar to a coal-fired power plant in that a solid fuel is combusted to heat water into steam.

The project will be managed and directed by the Department of Natural Resources' Division of Geological & Geophysical Surveys (DGGS) with a team composed of the Alaska Energy Authority (AEA), DNR Division of Forestry (DOF), DNR Division of Oil & Gas (DOG), and DNR Land Records Information Section (LRIS). The tasks will be conducted in three phases over 5 years:

- **Phase 1:** Convert all existing Energy resource data into a searchable GIS format with quantitative attributes. The energy resource data will include conventional sources—natural gas, coal, coalbed methane and shalebed methane—and unconventional sources—gas hydrates, geothermal, wind, hydro, biomass–forestry products and peat. Begin development of a user-friendly interactive web-based Alaska energy inventory map utilizing the LRIS AlaskaMapper engine. FGDC (Federal Geographic Data Committee)-compliant metadata will be written for all data. As a result, end users will get consistent, quality data that is well documented, providing them access to all the information they need to properly use the dataset. Further, providing accurate and concise metadata will allow users to focus on merging the data into their own projects and spend more time on analysis and understanding the implications of their results. ***Timeframe 2 years; FY 08 and FY09***

- **Phase 2: A.** Continue development of the Alaska energy inventory map web interface; **B.** Prioritize analyses of energy resources; where data are nebulous or incomplete, DGGS will initiate a field program to obtain the necessary new data from outcrop studies to accurately quantify geology-based resources. The project team will identify those areas where wind, hydro, or geothermal potential is present but sufficient data are lacking to assess and quantify the resource; and C. Develop a risk-weighted methodology for the inventory of all energy resources. ***Timeframe 3 years (including obtaining new geologic data); FY08 to FY11***

- **Phase 3:** Finalize the statewide inventory of all energy resources; complete the interactive web-based searchable GIS map. Conduct economic weighting analyses by area, with population size and demographics, using available data. The Alaska Energy Map web site will have a user-friendly interactive base map with selectable layers for all energy resources, community and mine energy requirements (diesel and energy equivalents), community and mine demographics, resource area land status, transportation (roads and airports), etc. ***Timeframe 1 year; FY12***

The final product will be an interactive user-friendly web-based Alaska Energy Inventory Map with a built-in risk-weighted (economic) energy resource inventory.

Why is this Project Needed Now:

This project has been needed for several years. Smaller projects have already been undertaken by various agencies in attempts to find local sources of power (oil and gas) for rural villages. Recent soaring crude oil prices have severely impacted rural Alaskans by increasing the cost of diesel fuel used for space heating and electrical power generation. The increased costs frequently necessitate a choice between heating a home or having food to eat. This situation has highlighted the issue again. This Alaska Energy Inventory CIP project will collect and compile the necessary information on conventional and unconventional statewide energy resources for their proper evaluation in a sound and scientific manner. Cost effective energy savings in rural Alaska may be achieved by finding local, economically viable sources of energy as alternatives to a diesel fuel-based system or in combination with a diesel fuel-fired power plant.

Specific Spending Detail:

FY2008

Line Item Expenditures

71000	Personal services	$252,300
72000	Travel	10,000
7300	Contractual/RSA	220,200
7400	Supplies	10,000
7500	Equipment	7,500
Total:		**$500,000**

Project Support:

Broad support can be expected from: (1) rural communities, (2) electrical power utilities, (3) private-sector energy exploration companies, gas, geothermal steam, and wind turbine manufacturers, and independent investors that could benefit from these studies; (4) Native regional and village corporations with stakeholder interests, (5) State and Federal government natural resource evaluation and management agencies including the Division of Geological & Geophysical Surveys (DGGS), Division of Oil & Gas (DOG), Division of Forestry (DOF), and Division of Mining, Land & Water (DMLW) from the State of Alaska's Department of Natural Resources; Alaska Energy Authority (AEA); Alaska Industrial Development and Export Authority (AIDEA); Department of Commerce, Community and Economic Development (DCCED); Department of Transportation & Public Facilities (DOTPF); the Denali Commission; the U.S. Bureau of Land Management (BLM); and U.S. Bureau of Indian Affairs (BIA); and (6) research institutions including the University of Alaska Fairbanks (UAF) and the University of Alaska Anchorage (UAA) Institute of Social and Economic Research (ISER).