HCR

3

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House District 10

House of Representatives

Sponsor Statement

HCR 3

House Concurrent Resolution 3 follows action taken by the 23rd Alaska Legislature to begin the process of determining a broad understanding of the State of Alaska's future energy needs.

While we continue to rely on oil and gas as our primary energy source, HCR 3 opens the door for renewable energy as a key component of long-term cost effective sources of energy for both urban and rural Alaskan communities. HCR 3 acknowledges that the development of renewable sources of energy is a strong potential source of economic development in the State of Alaska. With the expertise and resources available in the state, Alaska could lead the way in wind, geo, tidal, hydrogen, and biofuels.

HCR 3 encourages Governor Murkowski to join the Legislature by taking action in relation to further the development and production of renewable energy resources.

Representative_Jay_Ramras@legis.state.ak.us

HOUSE COMMITTEE REPC T

(9)
Date Referred to Committee: March 3, 2005 **FURTHER REFERRALS:**

Date of Committee Action: 03/14/05

The RESOURCES Committee considered: **HCR 3**

HOUSE CONCURRENT RESOLUTION NO. 3 **RENEWABLE ENERGY ALASKA PROJECT**

Relating to renewable energy resource development.

Recommends it be replaced with [ ] HCS *or* [ ] CS *for* _____(_____)
For Senate Bills with new title: [ ] Technical Title [ ] New Title: HCR_____ **[ ] Same Title [ ] New Title**

[ ] attach amendments
[ ] add new referral to _____Committee
[ ] Letter of Intent_____Committee

List of Abbrev for Depts.:
ADM
CED
COR
CRT
EED
DEC
DFG
GOV
HSS
LEG
LAW
LWF
MVA
DNR
DPS
REV
DOT
UA

NEW FISCAL NOTES *Assigned by Chief Clerk's Office

List by Dept(s):	*FN#	Fiscal	Indet.	Zero

PREVIOUS FISCAL NOTES

List by Dept(s):	FN#	Fiscal	Indet.	Zero
CED				✓

Signing with recommendations	Printed Last Name	DP	DNP	NR	AM
	OLSON	✓			
	ELKINS	✓			
	LOVE	✓			
	CRAWFORD	✓			
	SEATON	✓			
Chair:	SAMUELS			X	
Chair:	RAMRAS	X			

HOUSE COMMITTEE REPORT

3-3-05

(7)

Date Referred to Committee: February 22, 2005 **FURTHER REFERRALS: Resources**

Date of Committee Action: March 2, 2005

The LABOR AND COMMERCE Committee considered: **HCR 3**

HOUSE CONCURRENT RESOLUTION NO. 3 **RENEWABLE ENERGY ALASKA PROJECT**

Relating to renewable energy resource development.

Recommends it be replaced with [ ] HCS *or* [ ] CS *for* _____ (_____)
For Senate Bills with new title: [ ] Technical Title [ ] New Title: HCR_____ **[ ] Same Title [ ] New Title**

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NEW FISCAL NOTES *Assigned by Chief Clerk's Office

List by Dept(s):	*FN#	Fiscal	Indet.	Zero
H.L&C/CED	1			X

PREVIOUS FISCAL NOTES

List by Dept(s):	FN#	Fiscal	Indet.	Zero

Signing with recommendations	Printed Last Name	DP (3)	DNP	NR (1)	AM
Harry J Crawford Jr	CRAWFORD	X			
	LeDoux	X			
	ROKEBERG			X	
Chair: Tom Anderson	ANDERSON	X			
Chair:					

FISCAL NOTE

STATE OF ALASKA
2004 LEGISLATIVE SESSION

Fiscal Note Number: 1
Bill Version: HCR 3
(H) Publish Date: 3/3/2005

Revision Date/Time (Note if correction):
Dept. Affected: DCCED
Title: RENEWABLE ENERGY PROJECT
BRU
Component
Sponsor: Rep. Ramras
Requester: Rep. Ramras
Component No.

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Personal Services	0.0	0.0	0.0	0.0	0.0	0.0
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2004) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governor's FY 2005 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

This resolution has no fiscal impact.

Prepared by: Rep. Tom Anderson, Chair
Phone
Division: House Labor & Commerce Committee
Date/Time 3/3/05 10:01 AM
Approved by: Rep. Tom Anderson, Chair
Date 3/3/2005
Agency: House Labor & Commerce Committee

The Color of Electricity

Green power is coming to GVEA

What is green power?

While electrons may be undistinguishable from other electrons, their fuel sources can be quite different.

Green power is electricity supplied from one or more renewable energy sources. Wind, solar, water, geothermal, water, biomass and tides fall into this category. They're renewable because such energy is continually being rejuvenated by nature.

Historically most of our nation's electricity has been generated from fossil fuels such as coal, oil and natural gas. These fuels sources are commonly referred to as non-renewable energy because once such fuel is spent, it is not quickly regenerated by nature.

Why support green power?

Golden Valley has been evaluating programs and options for producing and purchasing green power for a few years. We know from surveying our members that:

- **86%** agree electric utilities need to plan now for when non-renewable resources start running out.
- **82%** agree GVEA needs to invest in developing alternative energy sources now to ensure long-term electric reliability.
- **79%** agree it means a lot to them if electricity comes from environmentally sound sources.
- **72%** agree that developing green power is necessary in order to reduce pollution emissions from burning fossil fuels.
- **64%** agree that increasing use of green power will reduce the nation's dependence on imported oil and increase national security.

Why does it cost more?

It may seem contradictory that green power – with its basically free fuel source – would cost more than non-renewable power. While the cost of producing green power is coming down, it is still more expensive than traditionally-generated power.

Wind power can be less expensive than coal or oil-generated power, but only in the situation of an optimally placed wind farm large enough to see significant economy of scale. The biggest wind farm GVEA could install before conflicting with the electrical limitations of our grid is not big enough to reach the desired economies of scale.

First electrical grid management technologies would need to be developed that allow us to feed the grid with 50 to 100 or more megawatts of wind. Then we would be able to install a wind farm that produced power at less cost than we could generate it. Currently a grid can have no more than 20 percent of its power from wind or a number of technical problems occur. Of course, this scenario relies on the availabili of sufficient wind resources to produ this much power.

Golden Valley is pursing wind gener tion sites in the Interior. We're als evaluating the potential for joint pr jects with other utilities in the state th may address the economies of scal and grid limitation issues.

In terms of technology, the trend fc renewable generation is like the tren for VCRs. When they first came on th market in the 1970s, costs exceede $2,000. But 30 years later you can nov find VCRs for about $50. In addition the technology is even better and th size of these units has decreased great ly. Such is the trend for nonrenewable generation technologies – the technology is improving, the efficiency is greater and the price is dropping.

Another reason green power is still more expensive than non-renewable power lies in capital costs. For example, the capital cost of a conventional power plant is lower than the capital cost of a wind generator. Solar and hydropower costs have even higher capital costs.

Another issue influencing cost is the fact that green power sources, such as wind and solar, only produce power when weather conditions are right. The rest of the time, a utility would need to rely on power produced by a conventional power plant.

So installing green power generation doesn't avoid the need for conventional plants. Instead, members must pay for the costs of two plants to cover the same amount of load. The only monetary savings is from the fuel not used in the conventional plant while green fuel sources are producing power.

How is it delivered?

Green power generated and distributed through Golden Valley's electric system would become part of the mix. Green power cannot be directed from a specific source to a specific meter.

For example, GVEA is part owner of the Bradley Lake Hydroelectric Project on the Kenai Peninsula. Our share of this green power source is 20 megawatts. The power is transmitted over the Intertie and is added to our total power generation mix.

The benefit is in the impact this green power project has on the environment. It reduces the amount of fossil fuel burned and subsequently the amount of emissions created.

When will green power be available at GVEA?

We expect to offer members a green power program before the end of the year. Our Alternative Energy Team is modeling the program after Chelan County Public Utility District's award winning SNAP program. SNAP stands for Sustainable Natural Alternative Power.

Chelan County PUD owns and operates the nation's second largest non-federal, publicly owned hydro generating system. In addition to the generation and sale of electricity, the District also provides water and wastewater service to residents of Chelan County. Chelan is located in central Washington.

Watch for this logo as we finalize plans to offer a green power program to GVEA members. The program would call for voluntary green power producers and voluntary purchasers of green power.

The SNAP program has two basic parts: Green power producers and green power purchasers.

The SNAP program would allow small scale power producers to distribute the power they generate using renewable resources through our electrical grid. These producers would not keep any of the power they produce.

The program would also allow members an opportunity to purchase alternative energy and support local producers of power from renewable resources. Members who wish to participate would sign up for a specific amount to be added to their bills on a monthly basis.

Like Chelan's SNAP program, funds collected would go directly to the local producers who supply power into the electrical grid for use by co-op members.

GVEA's Alternative Energy Team is working closely with the co-op's Green Power Advisory Committee, which was formed in 2003. We expect to offer a SNAP program at GVEA before the end of this year.

Chelan County PUD has more than 700 customers participating in their SNAP program as either producers or purchasers.

Who benefits?

Golden Valley members, the co-op and the environment all benefit from the advent of green power in our mix.

We know environmentally responsible power is a great concern for many members. We agree. The SNAP program will offer members the opportunity to support green power.

The cooperative benefits by expanding services to our members and by adding another fuel source to our mix.

Perhaps most importantly, a SNAP program is one more step we take as a community to take care of our environment.

While our SNAP program may look a bit different than Chelan's program, you can find more information at www.chelanpud.org.

GVEA

Golden Valley Electric Association

452-1151 • 1-800-770-GVEA • www.gvea.com

Alaska is blessed with some of the best renewable energy resources in the world, with wind, geothermal, tidal, hydro, and biofuels that all have commercial potential. Though solar is a proven application for small-scale use, there is currently no large-scale potential. Below is a short description of some of Alaska's renewable energy resources.

Wind

Alaska's wind resources are world class, with much of western Alaska and the Aleutians having the best wind in North America, according to the Department of Energy's wind atlas. The wind resource includes places like Kotzebue, which has proven that today's advanced technology works well even above the Arctic Circle. Last year Kotzebue Electric Association's turbines were available to make electricity 98% of the time and displaced over 100,000 gallons of diesel use. Kotzebue's success has led many other villages to look into the possibility of wind power to offset rapidly rising diesel costs. In 2004 the Denali Commission and the Alaska Village Electric Cooperative (AVEC) installed a wind system in Selawik. Over 50 other villages have been identified by the Alaska Energy Authority has having viable wind resources.

On the railbelt, Chugach Electric Association has been investigating wind near Anchorage for almost five years, and has found an excellent resource off the coast on Fire Island. The Fire Island wind development could eventually generate 100 megawatts of power. (To put that in perspective, the total peak electricity load on the entire railbelt is about 700 megawatts). In the U.S., wind energy is the fastest growing segment of the energy market, swelling at an average annual rate of 28% over the last five years. The highly efficient wind turbines that are being installed around the United States today can produce electricity for about the same cost as coal and natural gas fired plants.

Producing power from wind at Fire Island would provide a hedge against increasing natural gas prices which utilities currently rely on to generate power. Because there are zero fuel costs with renewable energy resources like wind, it's relatively easy for a utility to predict exactly how much power will cost for the 25 year life of the wind project. This allows utilities to plan well into the future. If the price of natural gas continues to increase rapidly, wind power could be cheaper than gas fired electricity relatively soon.

Municipal Light and Power (ML & P), Golden Valley Electrical Association, and Homer Electric Association are also all interested in the Fire Island wind development.

Geothermal

Alaska's geothermal resources are spread all over the state. The state has about 140 hot springs and over 40 active volcanoes. Chena Hot Springs Resort is in the process of building the state's first geothermal plant, which will generate 400 kilowatts and provide enough power for the resort 365 days a year. Private developers are also considering investments to produce geothermal electricity at Akutan and Dutch Harbor in the Aleutians, and Pilgrim Hot Springs near Nome. Besides interior hot springs like Chena, there is also geothermal activity in Southeast Alaska and the Wrangell Mountains. Mt.

Spurr could perhaps be the most promising prospect of all because of its close proximity to Southcentral's large electricity demand. The volcano is only about 40 miles from the transmission grid at Beluga. More exploration near Mt. Spurr could pay significant future returns.

Biofuels

Alaska has enormous untapped potential to make fuel from biological resources like fish oil, wood waste, and municipal garbage.

Perhaps the greatest potential source is the "biodiesel" being produced by collecting fish oil at fish processing plants. Last year the seafood producer UniSea, Inc., at Dutch Harbor displaced 1.25 million gallons of diesel by burning a 50/50 fish oil-diesel blend in its diesel generators and boilers. Fish oil requires minimal processing to be usable as fuel—an additional mechanical filtration step is all that is needed. Locally produced fish oil biodiesel blend fuels have the potential to create a cost-effective, sustainable energy supply for use in remote regions of Alaska, yielding cost savings and reducing dependence on imported diesel.

Advanced bioethanol technology turns ordinary low-value plant materials such as sawdust or waste paper into fuel ethanol. In 2004 Nova Fuels, Inc. announced that it would like to build an ethanol plant in Ketchikan that will convert wood waste and garbage into about 15 million gallons of ethanol per year. The company would take over the old Wards Cove site. The plant, which will cost an estimated $60 million, would employ between 35 and 50 people. The project could take garbage and wood waste from communities around the region and make it into a liquid transportation fuel.

Another potential biofuel project would capture the methane that is currently escaping from the Anchorage landfill. Today it's estimated that the gas has an energy potential equivalent to about 57,000 gallons of diesel per day. By the end of the landfill's life around 2045 it would be producing the energy equivalent of about 135,000 gallons of diesel per day.

REAP is investigating the potential for other biofuel projects around the state.

Tidal

Also known as marine power because energy can be captured from either tides or waves, this technology is in its infancy. It is currently being tested in Europe. Last year a wave project successfully brought power to 500 homes in Scotland. This spring six underwater turbines will be placed at the bottom of the East River in New York City to provide power to a food market on Roosevelt Island. San Francisco is also studying how it can tap into the energy of the waves and tides that surge under the Golden Gate Bridge. As the technology matures and becomes cost competitive, Alaska has enormous potential to develop tidal electricity projects in areas of great tidal fluctuation like Cook Inlet. REAP is following this technology and any proposals to test projects in Alaska.

Hydrogen

Many believe that using hydrogen in fuel cells to produce electricity for homes, industry, and vehicles is the future of power production. If this scenario develops, Alaska could use its renewable energy resources to make hydrogen through electrolysis. Electrolysis using electricity generated with gas or coal produces little net energy gain because of the fuel that is consumed in the process. However, if Alaska uses it vast wind and geothermal potential in the Aleutians to generate electricity to produce hydrogen from water, Alaska could become an exporter of hydrogen to Asia. Iceland is already positioning itself to use its geothermal resources and expertise to make hydrogen for Europe.

In the short term, if Fire Island is developed, Anchorage could elect to join a handful of cities in the world that are demonstrating fuel cell vehicles. (In 2003 Shell Oil built a "filling station" in Reykjavík, Iceland that dispenses hydrogen made through electrolysis into the city's fuel cell buses). Anchorage's hydrogen could be made through electrolysis fueled by wind-generated electricity. Fire Island could bring Anchorage to the forefront of changes in energy and transportation that are currently re-shaping the world.

Economic Development Benefits of Renewable Energy

From a Report by the Union of Concerned Scientists at http://www.ucsusa.org/clean_energy/renewable_energy/page.cfm?pageID=98

Renewable energy technologies can not only keep dollars in this country, but also create significant regional benefits through economic development. Many states are dependent on energy imports. Iowa and Massachusetts, for example, each import about 97 percent of the energy they use.[33] Renewable technologies create jobs using local resources in a new, "green," high-tech industry with enormous export potential. They also expand work indirectly in local support industries, like banks and construction firms. As the table shows, during the 1990s, the US renewable electricity industry employed nearly 117,000 people.[34]

TABLE 1

Employment in the Renewable Electricity Industry

	Direct Employment	Indirect Employment	Total Employment
Wind (1992)	1,260	4,350	5,610
Biomass (1992)			66,000
Photovoltaics (1994)			15,000
Solar Thermal (1994)	250	250	500
Geothermal (1996)	10,000	20,000	30,000
Total			**116,860**

Some renewable technologies, like biomass, are relatively labor intensive, which is one of the reasons they are slightly more expensive than their fossil fuel counterparts. For example, growing, harvesting, and transporting biomass fuels all require labor, as does maintaining the equipment. This means that much of the revenue for installing, fueling, and operating renewable power plants remains within the region where the power is used.

Renewables can mean increased revenues for local landowners. A Union of Concerned Scientists (UCS) analysis found that farmers could increase their return on land by 30 to 100 percent from leasing part of it for wind turbines while continuing to farm.[35] Another study found that adding 10,000 MW of wind capacity nationally would generate $17 million per year in land-use easement payments to the owners of the land on which the windfarms are situated, and $89 million per year from maintenance and operations.[36]

Renewables can contribute heavily to local taxes. Wind farms in California pay $10 million to $13 million in property taxes. And manufacturing capital-intensive renewables technologies can also be done domestically. According to the American Wind Energy Association, at least 44 states are involved in manufacturing wind energy system components.[37]

A UCS analysis for Wisconsin found that, over a 30-year period, an 800-megawatt mix of new renewables would create about 22,000 more job-years than new natural gas and coal plants would.[38] A New York State Energy Office study concluded that wind energy would create 27 percent more jobs than coal and 66 percent more than a natural gas plant per kilowatt hour generated.[39] A study of energy efficiency and renewable energy as an economic development strategy in Colorado by Economic Research Associates found an energy bill savings of $1.2 billion for Colorado ratepayers by 2010 with a net gain of 8,400 jobs.[40]

The California Energy Commission estimates that the 600 MW of new renewables that will be built using $162 million in public benefits funding in the state restructuring law will induce

- $700 million in private capital investment
- 10,000 construction jobs, with over $400 million in wages
- 900 ongoing operations and maintenance jobs with $30 million in long-term salaries
- gross state product impacts of $1.5 billion during construction and $130 million in annual ongoing operations.[41]

In addition to creating jobs, renewables can improve the economic competitiveness of a region by enabling it to avoid additional costly environmental controls on other industries, as well as by stabilizing long-term energy prices.

Renewables can also contribute to economic development by providing opportunities to build export industries. In developing countries that do not have electricity grids, pipelines, or other energy infrastructure, renewable energy technologies can be the most cost-effective options for electrifying rural villages. The American Wind Energy Association has estimated that global markets for wind turbines alone will amount to as much as $400 billion between 1998 and 2020.[42]

Other industrial countries are leaping ahead of the United States in renewable energy production, however, because they value the environmental benefits more highly and because they recognize the opportunity to supply export markets. In fact, Japan and various European nations are encouraging the development of renewables by providing

greater subsidies than does the United States.[43]

33. US Department of Energy, *Dollars from Sense: The Economic Benefits of Renewable Energy*, 1998, online at www.eren.doe.gov/utilities/pdfs/dollars.pdf. Includes many excellent examples of renewables/economic development synergy.
34. The US geothermal industry as a whole employs about 40,000. According to the National Corn Growers Association the corn-to-ethanol industry employs about 55,000 people (5,800 direct and 48,900 indirect).
35. Michael Brower, Michael Tennis, Eric Denzler and M. Kaplan, *Powering the Midwest: Renewable Electricity for the Economy and the Environment*, Union of Concerned Scientists, 1993.
36. Jamie Chapman, OEM Development Corp. and Steven Wiese, Planergy, Inc., *Expanding Wind Power: Can Americans Afford it?*, Renewable Energy Policy Project Research Report No. 6, October 1998. Available online at www.repp.org/index_ar.html.
37. *The Effect of Wind Energy Development On State and Local Economies*, National Wind Coordinating Committee, Wind Energy Series No. 5, January 1997.
38. Brower et al., *Powering the Midwest*, Union of Concerned Scientists, 1993, pp. 107-108. The study assumed 400 MW of wind, 110 MW conventional biomass, and 300 MW advanced biomass. Energy-employment studies are necessarily resource- and region-specific.
39. A.K. Sanghi., *Economic Impacts of Electricity Supply Options*, New York State Energy Office, July 1992.
40. Skip Laitner and Marshall Goldberg, *Energy Efficiency and Renewable Energy Technologies as an Economic Development Strategy*, April 1996, online at http://solstice.crest.org/renewables/era/index.html. Similar conclusions were found for the US and for nine other states studied.
41. Jan Smutney-Jones and John Stewart, San Jose Mercury News, November 22, 1998.
42. American Wind Energy Association, *Wind Energy and Climate Change: A Proposal for a Strategic Initiative*, October 1997, online at www.igc.org/awea/pol/ccwp.html.
43. For an overview of international renewables policies, see Christopher Flavin and Seth Dunn, *Climate of Opportunity: Renewable Energy after Kyoto*, Renewable Energy Policy Project, July 1998.

NonRailbelt Report
Findings and Recommendations
of the Alaska Energy Policy Task Force

Task Force Members

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Vice Chair
Alaska Wireless Technology
Chugach Electric Association
Board Member

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Joint Leadership Offices of
Speaker of the House
Representative Pete Kott
Senate President
Senator Gene Therriault

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Created by the 23rd Alaska Legislature
Legislative Resolve No. 24, 2003
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Alaska Energy Policy Task Force Report (non-Railbelt)

NonRailbelt Report
Findings and Recommendations
of the Alaska Energy Policy Task Force

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Letter from the Chair

Mike Barry

Many contributed to the work of this task force. I would like to thank each and every person and organization that presented to us. I would, especially, like to thank the individual members of the task force who set aside the needs of their particular organization to focus on those of the state as a whole. Special credit goes to Becky Gay and Bernie Smith who admirably and capably served as staff.

We have outlined many daunting challenges to meeting the electrical needs of the immense area and small population known as Alaska. It is vital that we become more efficient in our utilization of limited resources such as capital and human expertise in order to successfully meet these challenges.

To become better stewards we recognize that we must operate regionally rather than just one community at a time. We must plan and operate in the context of a model of sustainability, adhering to cost-effective principles of conservation and best practices. We need improved coordination between State and Federal efforts in funding infrastructure. We need to invest capital funding to achieve solutions that work as opposed to merely providing work.

We recognize that cost-effective electricity is crucial to quality of life and essential to economic health. Priority should be given to funding those projects which are regional in focus and management and which will support growth and diversification of our economy. Working together under a common set of principles and guidelines will allow Alaskans to meet the challenges ahead. We hope that the attached principles and guidelines will be helpful.

Legislative Directive

In the first session of the 23rd Alaska State Legislature, the Energy Policy Task Force (EPTF) was established by concurrent resolution to address the energy needs of Alaska. This was to be done in two reports, categorized for "Railbelt" and "NonRailbelt" areas. The Railbelt report was completed by December 31, 2003. This is the NonRailbelt report and it presents the Findings and Recommendations of the Task Force for those areas that comprise the largest geographic portion of the state.

For purposes of this energy report, NonRailbelt Alaska was defined as three distinct energy areas:

Four Dam Pool and Southeast Alaska,
Power Cost Equalization (PCE) communities, and
Southcentral Coastal communities.

The following mandates were met with the NonRailbelt report:

1. **Develop a long-term energy plan to efficiently enhance Alaska's economic future.**

2. **Review and analyze the state's current and long-term energy needs.**

3. **Address elements of Alaska's long-term energy needs that can be solved through action on the part of industry and/or government actions.**

With prior permission from the Joint Leadership of the House and Senate, the deadline for a report of task force findings for NonRailbelt areas was extended from March 31 to April 15, 2004, to coincide with the "sunset" provision of the Task Force.

I. A LONG-TERM ENERGY PLAN TO ENHANCE ALASKA'S ECONOMIC FUTURE

A. Vision Statement

Alaska holds a worldwide leadership role in energy supply, delivery and use solutions and environmental stewardship. Alaska will have reliable, economic, sustainable and secure power supplies for its citizens. Public funds will be invested only in infrastructure that is sustainable.

B. Mission Statement

Electricity is essential to meeting Alaska's economic, environmental, and educational development goals. The State will conduct its activities affecting energy in such a manner as to:

- **Promote reliable and secure electric power systems**
- **Promote the lowest cost for consumers**
- **Stimulate the economy**
- **Provide employment opportunities for Alaskans**
- **Improve the quality of life for all Alaskans**
- **Promote workforce development, including training Alaskans, for Alaska's utility sector.**
- **Enhance the State's social, cultural, economic and environmental assets**

C. Goals (Listed in no particular order)

- Achieve sustainability.
- Develop Alaska's position as a leader in competitively priced and reliably available electricity.
- Develop Alaska's electrical infrastructure while maintaining competitively priced energy.
- Ensure security of physical and cyber energy infrastructure.
- Promote research, development and demonstration of clean and renewable energy technologies.
- Promote conservation and energy efficiency across all of Alaska.
- Develop Alaska as a world leader in using and exporting competitively priced and reliably available fossil fuels.
- Ensure standardized and consistent permitting and regulatory processes.
- Establish Alaska as a national leader in developing energy projects using its natural resources, including its workforce.
- Develop viable local solutions to provide cost-effective electric energy for small, geographically remote Alaskan communities.

D. Recommendations

1. Workforce

Provide proper and focused workforce training to meet the challenges of 21st century energy industries.

Executive:

Perform an assessment of the opportunities for Alaska workers in the resource development and energy sectors and, based upon these opportunities, examine the deployment of a portion of Alaska's resources toward training and retraining of the workforce in these sectors.

Amend Department of Labor/Workforce Development (DOL/WD) regulations to facilitate the ability to develop training and internship programs, with an emphasis on jobs for Alaskans.

Fund education to ensure that Alaska workers have the education and skills required to maintain the vital role energy plays in our economy.

Update certificate of fitness requirements for utility linemen to enhance workforce availability and better track the successful practices of the other 49 states.

Ensure that Alaska workforce regulatory practices conform to national practices.

Private Sector:

Work with the DOL/WD in its assessment of opportunities for the Alaska workforce in the energy and utility sectors.

Maximize internship programs that will allow entry into the Alaskan workforce.

Encourage development of new energy and energy related businesses in Alaska.

2. Energy Generation

Alaska must be active in its pursuit of improving existing technologies and developing new generation technologies to increase efficiencies of present and future energy generation facilities.

Assist the private sector in its efforts to develop energy generation capacity

Executive:

Enhance the ability of public bodies, such as the Denali Commission and the Alaska Energy Authority (AEA), to assist the private sector and communities in efforts to develop adequate energy generation capacity, funded through conduit bonds and grants, to provide cost-effective electricity for all Alaskans.

Explore utilization of Alaska's abundant renewable resources in the production of hydrogen, which is a fuel for the emerging fuel cell technology

Executive:

Convene a workshop to discuss the potential for Alaska's leadership in hydrogen production. Such a workshop could serve as an educational tool and a platform for discussion between public, university research and private sector individuals and organizations.

Direct the University of Alaska and executive agencies to inventory ideal locations for future renewable energy generation sites that could be used as a source of hydrogen for in-state use and export.

3. Energy Infrastructure

The Task Force's goals and strategies focused on matters including, but not limited to: (1) generation infrastructure; (2) transmission and distribution; and (3) economic efficiency. As the electrical system ages, there will be increased concerns about reliability, sustainability and stability. Technology-driven system improvements will be required. There must exist within the State the capacity to deliver resources and energy to end-users.

Stimulate private-sector participation in Alaska's energy infrastructure to allow greater energy export capability to meet state, regional, and national energy demands.

Executive:

Provide tax-exempt bonding to fund projects, with the State retaining only the obligations that cannot be transferred to the participating utilities.

Work with Alaska's Congressional delegation to provide financing or economic incentives to promote energy infrastructure development.

Encourage adequate transmission infrastructure to increase economic development activity.

Conduct an assessment to identify the State's energy infrastructure security needs.

Executive:

The RCA should include in their deliberations the issue of cyber-security.

Private Sector:

Continue in the joint planning process to identify the State's energy infrastructure needs.

Encourage adequate and secure transmission infrastructure to increase economic development activity.

Continue to promote adequate fuel delivery infrastructure.

Assess the potential for the development of a locality into a sustainable energy community that utilizes novel distributed and/or renewable energy systems for residences and commercial enterprises.

Executive:

Examine the potential for the development of an Alaska locality into a sustainable energy community.

Legislative:

Examine opportunities to provide support for the development of such a community.

Alaska regional transmission planners should work to become leaders in energy infrastructure development.

Establish energy infrastructure development projects that will promote the reliable transportation of electricity throughout the entire State that meets the State's energy, environmental and economic needs.

4. Regulatory

Streamline all licensing, permitting, and regulatory processes of energy projects.

Executive:

Review agency practices regarding the licensing, permitting, and regulatory processes of energy projects. These agencies could also review the licensing, permitting, and regulatory processes of energy projects in other states so as to develop a study of best practices regarding these issues.

Establish and maintain regulatory processes that are consistent and have defined processing timelines and encourage utilities to maintain long-term financial health.

Legislative:

Enact appropriate legislation for the implementation of best practices regarding the licensing, permitting and regulatory processes of energy projects.

Private sector:

Provide input to the Executive and Legislative Branches to implement best practices regarding licensing, permitting and regulatory processes of energy projects for small and medium sized utilities.

II. CURRENT AND LONG-TERM ENERGY NEEDS

Findings

NonRailbelt Alaska is diverse, contains both rural and urban customers, and both roadless and road accessible communities. Their most common energy denominator is that none of the areas are connected to the Railbelt energy grid.

For purposes of this report, NonRailbelt Alaska is divided into three distinct energy areas:

- **Four Dam Pool and Southeast Alaska,**
- **Power Cost Equalization (PCE) communities**, and
- **Southcentral Coastal communities**.

A large state geographically with a very small population means in energy terms- - huge distances, minimal load. Most of Alaska is not accessible by roads. Access for most rural villages and Southeast Alaska is by air or water, making energy costs extremely high – as much as five times the national average. In Southeast Alaska, there is a lack of transmission interties to export surplus hydroelectric to other communities that need it.

As a comparison, in 2003, the average cost of power in Anchorage-Fairbanks-Juneau for residential customers was 10.6 cents/kWh, whereas in PCE eligible communities, the average residential cost of power prior to the State's rate reduction credit was 27.6 cents/kWh for 2003.

Over 66% of rural Alaska households use fuel oil as their heating source, priced at two to four times the national average. No electrical transmission lines interconnect the majority of Alaska's rural communities. In PCE Alaska, ninety utilities service 187 rural communities. Full funding of the Power Cost Equalization (PCE) program is not being met nor is a sustainable endowment provided.

A. Current Energy Needs NonRailbelt

Findings

- Over 50% of powerhouse structures and electrical distribution requires major repairs or replacement.
- Approximately 50% of fuel storage facilities are in poor condition.
- In Southeast Alaska, there is a lack of transmission interties to export surplus hydroelectric energy to other communities that need it.
- Average households in rural Alaska use approximately 425 kWh per month (compared to the average urban household in Alaska at approximately 700 kWh per month.)

See Appendix F
!SER Status Report

Southeast and Four Dam Pool

This region includes Juneau, Ketchikan, Sitka, Kodiak, Valdez and others and the following utilities.

See Appendix H

• Ketchikan (KPU)	Municipally Owned
• Petersburg (PMP&L)	Municipally Owned
• Wrangell (WL&P)	Municipally Owned
• Sitka (SMED)	Municipally Owned
• Juneau (AEL&P)	Investor Owned
• Valdez (CVEA)	Cooperative Owned
• Yakutat Electric	Municipally Owned
• Other SE communities (AP&T)	Investor Owned
• Four Dam Pool Joint Action Agency	Owned by participating cooperatives

The Four Dam Pool consists of Swan Lake, Lake Tyee, Terror Lake, and Solomon Gulch hydro plants. On January 31, 2002, AEA sold the Four Dam Pool projects to the Four Dam Pool Power Agency, an entity formed by Ketchikan Public Utilities, Wrangell Municipal Light & Power, Petersburg Municipal Light & Power, Copper Valley Electric Association, and Kodiak Electric Association, Inc.

Southeast Alaska has significant hydroelectric potential because of topography and climate. In Southeast, there is a lack of transmission interties to export surplus hydroelectric power to other communities that need it, including

communities that utilize fossil fuel to generate electricity. Approximately 90% of the total annual electricity generated in this region is by hydroelectric generation, with diesel internal combustion engines and oil-fired turbines as expensive additional generation sources.

Power Cost Equalization (PCE) Communities

In PCE Alaska, ninety utilities service 187 rural communities. Approximately 70,000 people, or 13% of the state's population, live in communities whose primary source of electricity is diesel fuel. The PCE program was established in 1984 as a successor to similar programs in effect since 1980 that reduce the end cost of electricity for residential and community facilities. PCE is available on the first 500 kWh used by households and on up to 70 kWh per resident for certain public facilities.

PCE communities are characteristically small, remote and accessible only by air or by seasonal barge service. Most PCE recipients reside in communities with populations of 400 or less. After application of PCE, the average cost of electricity for most rural communities is still more than 20 cents per kWh.

Because of the small size, remoteness and climactic extremes of PCE communities, alternative technologies such as hydropower and transmission grids are prohibitively expensive and impractical and emerging technologies have not yet been proven feasible. The high cost of power has attracted many entrepreneurs over the years who have proposed 'silver bullet' solutions, none of which have borne fruit. Efforts must continue to foster the fledgling supplemental wind power industry as well as other proven technologies to alleviate the burden in these communities of continued dependence on diesel fuel.

Eligibility

An electric utility participating in the PCE must: a) provide electric service to the public for compensation; b) during calendar year 1983, have had less than 7,500 megawatt hours of residential consumption or less than 15,000 megawatt hours if two or more communities were served; and c) during calendar year 1984, the utility must have used diesel-fired generators to produce more than 75% of its electrical consumption. Customer eligibility is based on actual power sold.

Residential customers are eligible for PCE credit on up to 500 kWh/month per customer. Community facilities, as a group, can receive PCE credit for up to 70 kWh/month multiplied by the number of residents in a community. State and federal offices/facilities, commercial accounts and public schools are ineligible for PCE.

See Appendix I for PCE details

FY03 PCE Program Participating Utilities
PCE program statistics comparing FY02 to FY03
PCE historical trends from 1993-2003

Southcentral Coastal: Kodiak, Cordova, Valdez and the Copper River Basin

The Southcentral Coastal utilities consist of Cordova Electric Cooperative (CEC), Copper Valley Electric Association (CVEA) and Kodiak Electric Association (KEA). It contains the Roadbelt area along the Richardson and Glenn Highways that are not connected to any grid. Kodiak is also part of the Four Dam Pool

Generation:

- Hydroelectric generation capacity
- Thermal generation capacity
- Combustion turbines
- Reciprocating engines

B. Long-term Energy Needs NonRailbelt

Findings

A long-term plan is needed for coordinated generation and transmission of power, to maximize the use of public funds, and to minimize the cost of power to the consumers.

The Task Force adopted the definition of long-term as 20 years or more. Within the next 20 years, it was determined that NonRailbelt Alaska needs to:

- **Create secure and reliable transmission between load centers**
- **Provide energy infrastructure for economic development**
- **Identify and evaluate long-term fuel sources**
- **Establish regional system operations where feasible**
- **Connect new areas to the Railbelt grid**
- **Replace aging generation**
- **Replace an aging workforce**
- **Lessen dependence on fossil fuel generation where renewable options are available**

C. Needs/Projects NonRailbelt

See Appendix G

D. Recommendations

Specific recommendations of how to fulfill future needs were as follows:

- Support increased vocational trade schools, higher education and training of technical and professional utility career staff and management in rural communities. www.aidea.org/AEAdocuments/TrainingDesc2003-2004.pdf
- State grants or financing should give priority to sustainable projects that consolidate operations and expand existing electrical systems.
- Encourage resource sharing among utilities to lower cost of installation, administration, operations and maintenance.
- Increase the proportion of renewables in long-term fuel sources. Renewables

include hydroelectric generation.
- Advance the physical and cyber security of the critical electrical infrastructure in Alaska.
- Implement alternative technologies as their costs become competitive with existing conventional technology.
- Have separate regulations for communities constrained by size.

III. INDUSTRY AND/OR GOVERNMENT ACTIONS

Findings

Government has played a role in bringing affordable power to Alaska in many ways, most notably through PCE and federal funding of energy programs. Industry, utilities and local governments have formed entities to voluntarily work toward regional energy priorities.

Alaska has contributed hundreds of millions of dollars in grant funding for the construction of hydro projects such as Bradley Lake and the Four Dam Pool and for transmission lines such as the Anchorage-Fairbanks Intertie that allows inexpensive power from natural gas and hydro power to be exported to the Fairbanks area.

Small hydro projects and interties have been built in rural Alaska but most rural communities still rely exclusively on isolated diesel power plants since the prevailing characteristics of rural Alaska, such as low population density and remote village locations, render most alternatives to diesel power infeasible. Recognizing this, another form of providing more affordable power through direct rate reduction (the PCE program) was initiated for rural Alaska.

While diesel has been proven to be the most cost-effective in most parts of Alaska, and the economic potential for wind-driven energy is improving, there may be site-specific opportunities that economically justify hydro, coal, methane, and/or coal-bed methane driven power generation.

The expenditure of $15.5 million in FY2002 was not sufficient to pay the "full formula" requirement, so PCE benefits were prorated by an amount equivalent to 85.83% over the entire year.

A. Power Cost Equalization (PCE) program

PCE is governed by Alaska Administrative Code 3 AAC 94.305-330 and 3 AAC 52.600-690 and by Alaska Statutes 42.45.110-170.
http://www.aidea.org/PDF%20files/FY03PCEreport.pdf

Legislation enacted in 2000 established the PCE Endowment Fund and appropriated $100 million into the Endowment Fund from the Constitutional Budget Reserve. In addition, AEA executed a Memorandum of Understanding in April 2000 with the Four Dam Pool purchasing utilities that deposited the $81 million in proceeds from the sale of the Four Dam Pool projects into the

Endowment Fund. The sale was finalized in January 2002. The Endowment Fund is invested and managed by the Alaska Department of Revenue.

When the Endowment Fund was created, it was anticipated that most, but not all of the funding for the PCE program would come from the Endowment Fund. As of 3/31/04, the market value of the fund is approximately $180 million. However, even with the more optimistic market earning assumptions at that time, the projections showed that approximately $2.3 million in additional funding would be needed each year from other sources.

The full program demand for FY2003 was approximately $18.4 million if funded at 100%. If the Legislature appropriates insufficient funds to pay the "full formula" requirement, PCE benefits are reduced to a prorated amount over the entire year.

Government PCE Process

1. The Regulatory Commission of Alaska (RCA) determines the PCE level per kWh for each utility. Two categories of costs are used in determining the PCE level:
   a) Fuel expenses: the cost of fuel, including transportation; and
   b) Non-fuel expenses; other costs such as salaries, insurance, taxes, power plant parts and supplies, interest and other reasonable costs.

2. AEA receives eligible utilities' monthly reports to document the eligible power sold. AEA calculates the amount of PCE on a monthly basis and issues payment to the utility to cover PCE credits that the utility has already provided to its eligible customers in the form of a reduced monthly electric bill. AEA determines the prorated payment level required if the appropriation is insufficient to pay PCE at 100%.

3. AEA also determines the eligibility of customers and of community facilities. Costs below 12.0 cents/kWh and above 52.5 cents/kWh are not eligible for PCE. If the eligible costs are 52.5 cents/kWh or more, the maximum PCE level is 38.48 cents/kWh (52.5 cents – 12.0 cents = 40.5 - cents x 95% = 38.48 cents). A participating utility must meet generation efficiency and line loss standards, otherwise the PCE level is reduced to reflect those standards.

Formula Used to determine PCE level/kWh for a utility:
95% of the eligible costs per kWh between 12.0 cents/kWh, "the floor, and 52.5 cents/kWh, "the ceiling."

For PCE eligible communities that sell more than 1 million kWh, the average rate prior to PCE credit being applied was 22.6 cents/kWh; however, for communities that sell less than 1 million kWh, the average rate prior to PCE credit being applied was 34.69 cents per kWh

B. Regional Operators

Southeast Conference www.seconference.org
An organization of industry and local governments consolidating the interests of the region and has been successful in obtaining federal authorizations and funding. In April of 2004, Southeast Conference and its member utilities and communities voted to proceed with the formation of a **Generation & Transmission (G&T) Cooperative** that will serve as the owner and operator of specific Intertie segments within Southeast Alaska.

Four Dam Pool Power Agency (FDPPA)
A regional entity formed in 2002. It is Alaska's first Joint Action Agency (JAA), an entity formed by Ketchikan Public Utilities, Wrangell Municipal Light & Power, Petersburg Municipal Light & Power, Copper Valley Electric Association, and Kodiak Electric Association, Inc.

Alaska Village Electric Cooperative (AVEC)
A non-profit cooperative incorporated in 1967 under guidelines of the Rural Electrification Administration (REA) - now Rural Utilities Service (RUS) - to construct and operate generation and distribution systems in Alaskan villages. AVEC serves one third of Alaska's rural population with power plants and diesel tank farms in 47 villages and distribution systems in 51 communities. Although cost of power in AVEC communities is high at 40 cents per kWh, the village systems are essentially completely self-sufficient and revenues generated (including about 28% from PCE) cover all costs of operation including design and construction of new plant, operation and maintenance of existing plant, administration, insurance, billing and collections, debt service, depreciation and amortization, etc.

C. Federal Funds

Denali Commission www.denali.gov
"The Denali Commission is an innovative federal-state partnership established by Congress in 1998 to provide critical utilities, infrastructure, and economic support throughout Alaska. Our focus encompasses five major categories of improvements: energy, health care facilities, training, intergovernmental coordination, and infrastructure (economic development, telecommunications, washeterias, and multi-use facilities)."

The Denali Commission has an investment policy that must be met and has introduced the concept of sustainability, which is still evolving.
http://www.denali.gov/Program_Documents/Investment%20Policy%20%20(02-13-04%20%20-%20public%20rev.%20draft).pdf

AEA's Rural Energy Group (AEA-REG) and AVEC Programs

AEA's Rural Energy Group (REG) and AVEC receive the majority of their funding for rural energy programs from the Denali Commission. A plan and funding for long-term operation and maintenance of bulk fuel storage facilities and generation plants are needed. General coordination of all rural utilities is needed (sewer, water, solid waste, power, and fuel). Many upgrades are funded by the Denali Commission.

D. Recommendations

- Provide NonRailbelt utilities the opportunity to obtain grants and tax-exempt financing for electrical infrastructure that provides the lowest cost of power to members and efficient operation.

- All other considerations being equal, projects should in general not be owned, operated or maintained by the State.

- The State should encourage NonRailbelt utilities to accept ownership of state-owned energy assets to reduce bureaucracy, thereby reducing state expenses and offering utilities the benefits of long-term ownership.

- Encourage formation of new owning entities such as the G&T in Southeast and support existing regional operators.

- Encourage regional planning among utilities to lower cost of installation, administration, operations and maintenance.

- The State, when funds are available, should fully fund the PCE endowment to make the program sustainable and self-funding at the level the legislature deems appropriate.

- Maximize federal appropriations for Alaska, by appropriately providing state matching funds for energy projects.

- Any divestiture of state-owned energy assets should be consistent with the above. If there are legislative or regulatory issues, utilities should work cooperatively to determine actions needed.

IV. OTHER TOPICS FOR FUTURE CONSIDERATION

Findings

The Task Force either touched on these subjects or found it did not have sufficient time to address these and form valid recommendations for the Legislature under the deadline given.

A. Critical Infrastructure Protection (CIP)

Homeland security efforts to list priority infrastructure includes the utility assets. Utility groups and representatives from associated sectors such as telecommunications must continue to cooperate to provide reliable power with due regard for changing demands of security.

B. Energy Efficiency, Conservation and the Environment

Efforts to use energy resources more efficiently can reduce energy costs and benefit the environment. Energy efficiency is broader than simple energy conservation, or eliminating unnecessary energy use. Efficiency involves achieving necessary goals, while minimizing energy requirements. Efficiency should not compromise comfort, performance or productivity, but rather meet those requirements through more proficient means. Environmental benefits are direct; if energy use is avoided, then the environmental impacts are avoided as well. Examples of projects eligible for AEA's programs include:

- Efficiency upgrades to diesel power plants.
- Update energy audit for facility efficiency.
- System Performance Monitoring.
- Residential lighting and hot water retrofits.
- Heat recovery program.

C. Emerging Energy and Environmental Technologies

Examine the establishment of public/private partnerships that benefit Alaska research institutions and commercial enterprises that engage in the commercialization of energy and environmental technologies. Biomass projects such as fish oil/diesel have special application for Alaska. Wind energy monitoring and assessment and other alternative energy projects are already underway across Alaska.

D. Renewable Energy

Renewable power can be competitive. There are a number of technologies considered renewable and these include: hydroelectric, solar, biomass, geothermal, tidal and wind.

Southeast Alaska, Southcentral and the Alaskan Peninsula have significant hydroelectric potential. A number of projects have been studied that could potentially serve the Southeast area. The development of an interconnected transmission system within the region could assist in the development of some of these hydro projects. There is potential for hydroelectric developments in other parts of the state as well, and these should be explored and developed as feasible.

Solar, biomass, geothermal and tidal are in various stages of technological development and do not currently contribute, to a great extent, to the national energy supply. Solar at this time is expensive and because of Alaska's latitude is not considered a likely candidate for large-scale energy production. There are

some geothermal resources in the state. As with other technologies, tidal power is developing and it will be some time before it becomes a significant and competitive generation resource. However it is prudent for energy planners to continue to monitor the development of this technology.

Wind power is being studied as a potential renewable generation resource for many areas. http://www.aidea.org/PDF%20files/Windmap.pdf The technology is the beneficiary of more than 20 years of intense research and development. Large-scale wind projects are being installed across the country and around the world. These projects use large turbines and are installed on a scale that allows for the power to be priced competitively. Smaller turbines have been used for rural generation applications in the state and have been shown to be rugged and reliable. See http://www.aidea.org/Wind.htm for a preliminary High-Resolution Wind Map. These modern high-resolution maps represent a dramatic improvement over those developed in the 1980s. The improved maps have proven extremely useful when overlaid with GIS data for transmission and land use in prospecting for wind development. Developing a high resolution wind map will increase understanding of Alaska's wind resources, and will focus efforts on where more detailed wind monitoring and construction efforts are most beneficial.

E. Gas Line Projects

There are competing interests for use of Alaska natural gas, both instate and externally. A potential intrastate gas pipeline that would deliver natural gas or propane to Southeast Alaska communities with a piped distribution system is under consideration. A feasibility study is needed to determine if piped natural gas or propane can be delivered at a price that would compare favorably with bottled propane, oil, and electricity for space and water heating requirements. An instate gas line bringing gas to tidewater in Valdez or Cook Inlet, for distribution and/or export is of major consequence to Alaska utilities. Industrial processes, commercial LNG opportunities, heating and generating electricity all compete for the fuel. A competing gas line to mid-America, across Canada, also has received significant study. For the utility future, the questions of supply and cost of alternatives remain. Whether gas is piped to market, or meets the load as electricity, electrical users will be affected.

F. Coal

Data for electricity costs in other States clearly shows that more coal fired power in the generation mix results in lower electricity cost. Relatively high capital cost is often a serious impediment to building coal plants for small utilities. Transmission and access infrastructure to link communities and areas of high natural resource potential will promote growth and diversification of Alaska's economy.

As new industrial activity is developed, such as large mine projects and the Alaska gas pipeline, opportunities will arise to tap heat and/or electricity generating plants needed for these developments. There are many sedimentary basins in Alaska that hold coal resource potential which is largely unexplored, such as in Southwest Alaska and the Yukon Basin.

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www.seconference.org
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Also:
West Virginia Energy Plan
Iowa Energy Plan

Glossary

Alaska Energy Authority (AEA) http://www.aidea.org/aea.htm
The Alaska Energy Authority is a public corporation of the state of Alaska with separate and independent legal existence. The agency is responsible for the administration of various state power projects and programs. Pursuant to legislation enacted in 1993, the members of the Alaska Industrial Development and Export Authority (AIDEA) Board of Directors also serve as Board of Directors of AEA. Concurrently, the Executive Director of AIDEA also serves as Executive Director of AEA. Pursuant to legislation effective July 1, 1999, the rural energy programs previously administered by the former Department of Community and Regional Affairs, Division of Energy, were transferred to AEA for administration.

Alaska Electric Generation and Transmission Cooperative (AEG&T)
Created in 1984 by Homer Electric Association and Matanuska Electric Association. AEG&T's mission is to assist statewide development of financially viable and environmentally sound energy systems that are safe, reliable, and efficient.

Alaska Industrial Development and Export Authority (AIDEA) http://www.aidea.org
The Alaska Industrial Development and Export Authority (AIDEA) is a public corporation of the state of Alaska with separate and independent legal existence. AIDEA is governed by a five member board comprised of the commissioner of revenue, the commissioner of community and economic development, one other person appointed by the governor who serves as the head of a principal department of the executive branch, and two public members appointed by the Governor. AIDEA is a profit-motivated, public corporation of the state created by the Legislature in 1967. AIDEA pays its own operating expenses while continuing to expand its ability to fuel economic development and pay an annual dividend to the state general fund.

Capacity
The maximum amount of power, normally expressed in megawatts, that a given system or subsystem can carry or produce at a particular moment, and is typically used to represent the real production capability rating of a generation or transmission system.

Cogeneration
The simultaneous production of power and thermal energy, such as burning natural gas to produce electricity and using the heat produced to create steam for industrial use.

Combined Cycle (CC)
An electric generating technology in which additional electricity is produced from otherwise lost waste heat exiting from the gas turbines.

Combustion Turbine (CT)
A machine that generates rotary mechanical power from the energy of a stream of fluid.

Cooperative
A group organized to supply electricity to a specific area; a cooperatively owned electric utility. A non-profit utility owned by its members.

Demand
The rate, expressed in megawatts (MW), at which electric energy is delivered to or by a system, part of a system, or piece of equipment at a given instant, or averaged over a designated period of time.

Distributed Generation
This term generally refers to small-scale energy generation spread among several producers, but it can also refer broadly to any type of energy generation that is spread among multiple producers. Distributed generation is most commonly used to insure that sufficient energy is available to meet peak demand. It may also be used as part of a fuels diversity program.

Distribution Line
A power line which delivers electricity throughout urban and rural areas. Typically between 2,300 and 25,000 volts.

Generation
The process of producing electric energy by transforming other forms of energy. It also refers to the amount of electric energy produced, expressed in megawatt-hours (MWh).

Generation and Transmission Company (G&T)
Term for a company that provides both energy production and facilities for transmitting energy to wholesale customers.

Gigawatt (GW)
A unit of measure equal to one billion watts or one thousand megawatts.

Integrated Resource Planning (IRP)
This term refers to a planning method that takes into account all resources available to or required to meet supply needs within an area or region that produce to the lowest possible cost.

Intertie
A tie permitting a flow of energy between the facilities of two electric systems.

Investor-Owned Utility
A utility owned privately (or by stockholders) and operated as a for-profit company.

Kilovolt (kV)
A unit of measurement of electrical force of pressure equal to 1,000 volts.

Kilowatt (kW)
A unit of power equal to 1,000 watts.

Kilowatt-Hour (kWh)
The most commonly used electrical measurement equal to 1,000 watts for one hour.

Load
The moment-to-moment measurement of power requirement in the entire system.

Megawatt (MW)
One thousand kilowatts or one million watts.

Peak Load, Peak Demand
These two terms are used interchangeably to denote the maximum power requirement of a system at a given time, or the amount of power required to supply customers at times when need is greatest. They can refer either to the load at a given moment (e.g. a specific time of day) or to averaged load over a given period of time (e.g. a specific day or hour of the day).

Railbelt
For purposes of this report, the power-sharing area between Interior Alaska, from Fairbanks, and Southcentral, to Homer, connected by roads, generating facilities and transmission lines, which include the Alaska Intertie and the Bradley Lake Hydro Project.

Railbelt Energy Study (RES)
Five utilities commissioned a study on the Railbelt. The purpose of the study is to identify the location and type of generation asset that satisfies future growth within the Railbelt.

Regulatory Commission of Alaska (RCA) http://www.state.ak.us/rca/
Formerly known as the Alaska Public Utility Commission. The RCA is the State's regulatory body overseeing utilities.

Roadbelt
That part of Alaska that is road-accessible, but not connected to the Railbelt grid, like Glennallen.

Sustainability
"In its simplest form, a sustainable utility is one where available financial resources, from all sources, are at least equal to the total cost of the utility. Total cost includes management, operation, maintenance, cost of capital renewal and replacement (after the design life has been achieved), necessary to maintain an acceptable level of service now and for future generations." From the November 2001 report of the steering committee of Sustainable Utilities in Rural Alaska

Transmission Line
A set of conductors, insulators, supporting structures, and associated equipment used to move large quantities of power at high voltage.

Volt
The unit of electrical measurement, which is similar to "pressure", that pushes current through a conductor.

Watt
A unit of electrical measurement used to determine the rate of energy delivered at some point. Watts = Voltage x Amperes

APPENDIX F

ISER Report/Current Needs

A different geographic look at the statewide situation.
http://www.iser.uaa.alaska.edu/Publications/akelectricpowerfinal.pdf

ALASKA ELECTRIC POWER STATISTICS
REGIONAL MAP

1a. Installed Capacity (KW)

Region	PCE	Non-PCE		Total
		Railbelt	Non-Railbelt	
Arctic Northwest	76,102	0	30,850	**106,952**
South Central	18,931	1,208,902	124,104	**1,351,937**
South East	41,844	0	373,902	**415,746**
South West	69,141	0	0	**69,141**
Yukon	34,557	277,000	3,572	**315,129**
Totals:	**240,575**	**1,485,902**	**532,428**	**2,258,905**

APPENDIX F, cont.
ISER Report/Current Needs

1.b. Net Generation (MWh)

Region	PCE	Non-PCE		Total
		Railbelt	Non-Railbelt	
Arctic Northwest	103,068	0	76,094	179,162
South Central	26,789	3,530,534	203,762	3,761,085
South East	32,046	0	672,422	704,468
South West	167,057	0	0	167,057
Yukon	57,842	774,543	2,134	834,519
Totals:	386,801	4,305,077	954,412	5,646,290

1c. Sales (MWh)

Region	PCE	Non-PCE		Total
		Railbelt	Non-Railbelt	
Arctic Northwest	77,799	0	73,797	151,596
South Central	3,406	3,056,000	223,278	3,282,684
South East	70,158	0	636,044	706,202
South West	153,925	0	0	153,925
Yukon	52,249	1,071,392	1,788	1,125,429
Totals:	357,537	4,127,392	934,907	5,419,836

1c. Revenue ($000)

Region	PCE	Non-PCE		Total
		Railbelt	Non-Railbelt	
Arctic Northwest	19,925	0	7,616	27,541
South Central	1,114	372,050	38,563	411,727
South East	3,332	0	56,054	59,386
South West	38,367	0	0	38,367
Yukon	12,680	89,816	108	102,604
Totals:	75,418	461,866	102,341	639,625

PCE = Utilities in the Power Cost Equalization Program
Railbelt = Utilities interconnected along the Alaska Railroad

APPENDIX G

Needs/Projects for the NonRailbelt

This list contains projects currently under discussion in various venues, which have not necessarily been investigated or endorsed by the Task Force. The list is not meant to be all-inclusive.

- **Southwest Alaska:** The Calista Corporation has prepared an energy study that proposes a coal-power plant at Bethel, coal supplied by the Quinsam Mine in British Columbia, wind turbines along the coast, and region-wide transmission grid would provide low cost. The transmission line could also supply power to Donlin Creek exploration, if it is developed into a mine. Alaska coal could replace the British Columbia coal if it becomes commercial available at competitive rates.

- **Coalbed Methane Project:** The Holitna Energy Corporation (HEC) was formed in April 2003 for the purpose of developing an energy supply for the Donlin Creek exploration, nearby settlements and, potentially, the region. HEC applied for a state of Alaska Shallow Gas Lease. This lease will allow HEC to do seismic work and drill for any gas accumulations that exist, at least partially, within 3,000 feet of the surface. The Holitna basin is located approximately 50 miles from Donlin Creek. The deepest portion of the Holitna basin has a high potential for oil, natural gas, and coal.

- **Northwest Alaska:** Northwest Alaska has a deposit of arctic coal stranded five miles inland from the Chukchi Sea, known as the Deadfall Syncline coal deposit. This deposit contains resources adequate to support a mining operation of one million tons per year for 20 years. A Northwest Alaska Energy Plan should include a coal power plant to generate power and a transmission line to power the Red Dog Mine. The plan should also include a road to transport the mined arctic coal to tidewater for export. This could open up other resources in the Northwest area with coal-fired power.

- **Donlin Creek Gold Mine:** A potential 125MW-250MW coal fired power plant at the Beluga coal property (West Cook Inlet) would provide the generation of electricity to the Donlin Creek Gold Mine via a new transmission line.

- **Pebble Gold-Copper Mine:** A potential 200MW coal, gas, LNG and or Propane fired power plant to provide the generation of electricity to the Pebble Gold-Copper Mine in Newhalen/Nondalton area (Bristol Bay region)

- **Akutan:** A potential 10MW (maybe larger) geothermal energy power plant in Akutan. This power plant could supply electrical power to the fish processing facility.

APPENDIX G, cont.
Needs/Projects for the NonRailbelt

- **Mt. Makushin:** A potential geothermal project at Mt. Makushin, Unalaska, that would not only supply energy to the City of Unalaska/Dutch Harbor and the fish processing facilities, but also has the possibility of converting this sustainable high temperature and super-critical geothermal fluids/energy into an economic and transportable form of fuel—Hydrogen—perhaps in the form of methanol—plus the metals/minerals potential.

- **Bradfield Road Project**: The State of Alaska and communities of Southern Southeast Alaska have been exploring the potential of extending a road up the Bradfield Road south of Wrangell tying into the existing road system in British Columbia, Canada. The Lake Tyee Hydro project is located at the Bradfield canal. The feasibility of extending a transmission line from Southeast Alaska into Canada intercon. ecting with the B.C. grid, which is tied into the North American grid, is currently under evaluation.

Southcentral Coastal
Regional projects
- **Extend the distribution systems**: Along the Richardson, Edgerton and Glenn (Tok Road) highways to serve new customers.
- **Transmission line:** To Matanuska Valley (MEA) or Delta (GVEA.)
- **Transmission line:** Interconnect Cordova and Copper Valley Electrical systems.

Copper Valley Electric projects
- **Glennallen:** Diesel Power Plant Upgrade.
- **Valdez:** Diesel Plant Upgrade.
- **Lake Louise:** Distribution line to south shore of Lake Louise and customers along the Lake Louise road.
- **Alyeska Marine Terminal**: Interconnect the Valdez Marine Terminal to CVEA's system

Cordova Electric projects
- **Transmission line:** Line replacement project along the Copper River highway between the city center and the airport.
- **Upgrade**: Aged cable along Copper River Hwy to Airport, FAA, and USCG.
- **Conversion:** Convert aged OH to UG along Whitshed Road.
- **Humpback Creek Hydro**: Upgrade and water storage.
- **Line extension:** To Shepard Point (Cordova Oil Spill Response Facility.)
- **Upgrade**: Aged substation bus to enclosed substation.
- **Sheridan Glacier Road Line Extension:** To developing Native Corp. lots.

APPENDIX G, cont.
Needs/Projects for the NonRailbelt

Kodiak Electric projects

- **Harriman Powerhouse Revitalization Project:** Replaces 30 year old diesel units with more fuel efficient, reliable, cleaner and lower cost units
- **Anton Larson Line Extension:** Extends distribution system by 13 miles to the community of Anton Larson, which currently consists of 15-20 homes.

Rural

- **Bulk Fuel Upgrades (BFU) and Rural Power System Upgrades (RPSU):** Total funds required to upgrade the power plant utilities and the bulk fuel storage in the rural communities (estimated by AEA, AVEC, and the Denali Commission), is $644,000,000. The majority of the funding is provided by the Denali Commission.

- **RPSU Funding Needs:** A 2000 AEA assessment of power plant facilities in communities (AEA = 128 communities, AVEC = 51 communities.) In terms of facility upgrades, AEA is approximately 10% complete with the initial scope of projects. Based upon current and projected funding, AEA anticipates completing the program of upgrading their respective project communities by 2015.

APPENDIX G, cont.
Needs/Projects for the NonRailbelt

AEA Rural Power Systems Upgrade Priority Rankings

Community		Rank
[redacted]		
Chitina w/hydro	AEA	1
Kerluk	AEA	2
Stony River	AEA	3
Tatitlek	AEA	4
Newtok	AEA	5
Kovuk, Pwrhs	AEA	6
Buckland	AEA	7
Tanana	AEA	8
Crooked Creek	AEA	9
Teller	AEA	10
Mtn Village	AEA	11
Atka w/hydro	AEA	12
Steelmyte	AEA	13
Nanakiak	AEA	14
Hydro Bay	AEA	15
[redacted]		
Nikolski	AEA	17
Tatitlek	AEA	18
Diomede	AEA	19
Tuntutuliak Wings	AEA	19
Rulukan	AEA	21
[redacted]		
Chignik Bay #2	AEA	23
Igiugig	AEA	23
Ivanof Bay	AEA	23
Port Heiden	AEA	23
Kwethluk	AEA	23
Chignik Bay #1	AEA	28
Akhiok	AEA	29
[redacted]		
Nikolai	AEA	31
Central	AEA	32
Menlaska Lake	AP&T	33
Lake Minchumina	AEA	34
Larsen Bay w/Hyd	AEA	35
Chefornak	AEA	36
False Pass	AEA	36
[redacted]		
Healy Lake	AP&T	38
Eagle	AP&T	40
Twin Hills	AEA	41
[redacted]		
Akiak	AEA	42
Fort Yukon	AEA	43
Takotna	AEA	43
Beaver	AEA	45
[redacted]		
Chuathbaluk, w/hydro	AEA	48
[redacted]		
Napaskiak	AEA	50
Pilot Point w/BFU	AEA	50
Ruby	AEA	50
[redacted]		
Pelican	AEA	54
[redacted]		
Akhiok	AEA	54
[redacted]		
AEA Projects		117
[redacted]		

Community		Rank
Northway	AP&T	58
[redacted]		
Tatitlek	AEA	61
Ellin Cove	AEA	62
Kobuk	AEA	62
[redacted]		
Allakaket	AEA	65
Chistochina	AP&T	65
[redacted]		
Chuathbaluk	AEA	68
[redacted]		
Clarks Point	AEA	69
Nunam Iqua	DOWL	69
Iliamna	AEA	69
Elowk #2	AEA	69
[redacted]		
Napaskiak	AEA	73
[redacted]		
Gustavus	AEA	77
Rampart	AEA	77
[redacted]		
Tok	AP&T	81
Venetie	AEA	82
Saint George	AEA	82
Cohnlen Cove	AP&T	83
Angoon	AEA	85
Cold Bay	AEA	85
Hallokatle	AEA	85
Kipnuk	AEA	85
[redacted]		
Koyu	AEA	90
Unalakleet	AEA	90
Whale Pass	AEA	92
White Mtn, Perm	AEA	96
[redacted]		
Haines	AP&T	100
Chignik Lake	AEA	101
Port Alexandr	AEA	101
Hollis	AP&T	101
Hydaburg	AP&T	101
[redacted]		
Deering Dist	AEA	106
Birch Creek	AEA	106
Kasaan	AEA	106
Perryville	AEA	106
Red Devil	AEA	106
[redacted]		
Atmautluak, Dist	AEA	116
Kotlik, Dist	AEA	116
Ekwok	AEA	116
Nelson Lagoon	AEA	116
Tellin	AP&T	116

Community		Rank
[redacted]		
Point Baker	AP&T	117
Port Protection	AP&T	118
Klokovin	AEA	125
Chefornak	AEA	125
Mountain	AEA	125
Saint Paul	AEA	125
Sand Point	AEA	125
[redacted]		
Eyak	AEA	132
King Cove	AEA	133
Lime Village	AEA	133
Nauiati	AEA	133
[redacted]		
Settles	AP&T	137
Tuntutuliak, Dist	AEA	138
Chignik Lagoon	AEA	138
Gistene	AEA	138
[redacted]		
Akutan	AEA	143
[redacted]		
Tanana	AEA	146
[redacted]		
Kwigillingok	AEA	150
Levelock	AEA	150
[redacted]		
Unalakleet	AEA	156
Hoonah	AP&T	156
[redacted]		
Atmautluak, Pmts	AEA	158
Kotlik, Dist	AEA	158
Chenega Bay	AEA	160
Kokhanok	AEA	161
Manley Hot Spr	AEA	162
Arctic Village	AEA	163
Hughes	AEA	164
Kongiganak	AEA	164
Stevens Village	AEA	164
[redacted]		
Tuluksak	DOWL	166
Kovuguk, Distribution	DOWL	166
Deering	DOWL	168
Tuntutuliak	DOWL	169
Kotlik	DOWL	169
White Mtn, Distribution	DOWL	170
[redacted]		
Updated 4/12/04		

APPENDIX G, cont.

Needs/Projects for the NonRailbelt

- **BFU Funding Needs**: AEA made an assessment in 2000 of Bulk Fuel Storage facilities in 171 communities. The result is that AEA is responsible for 141 projects while AVEC is responsible for 51 communities. The balance of the 132 projects had a bulk capacity upgrade need of approximately 26,000,000 gallons. In a typical community project, AEA upgrades approximately 90% of the existing storage capacity. This average is anticipated to decline as AEA undertakes projects that are lower on the deficiency list and thus require less effort to upgrade. To date (including the 2003 construction season), AEA has upgraded 9,500,000 gallons of capacity and has projected that only 11,000,000 of capacity remain to be upgraded. Funds needed to complete the Bulk Fuel storage facilities total $343,000,000 (AEA $196,000,000; AVEC $147,000,000).

APPENDIX H

Needs/Projects for Southeast and Four Dam Pool Communities

The mountainous terrain coupled with a wet, maritime climate provide significant opportunities for hydroelectric generation. The mountainous terrain and island environment has also limited the development of roads and other infrastructure including transmission lines connecting the communities within the region. Hydroelectric power plants and diesel generators provide nearly all of the electric power generation in Southeast Alaska. Natural gas and coal, the primary fuel sources for electric generation in the Railbelt areas of the State, are not commercially available in Southeast.

Primary Southeast Alaska Electric Utilities and 2002 Energy Sales

	Utility	Sales (MWh)	% of Total
Upper Lynn Canal Region			
Skagway	AP&T	10,521	1.4%
Haines	AP&T	11,725	1.6%
Chilkat y/Klukwan	THREA	1,308	0.2%
Subtotal		23,554	3.2%
North Region			
Juneau	AEL&P	311,550	41.9%
KMC-GC (Greens Creek)	Self	55,845	7.5%
Hoonah	THREA	4,161	0.6%
Gustavus	Gustavus Electric Co.	1,390	0.2%
Excursion Inlet Cannery	Self	5,375	0.7%
NPS - Glacier Bay	Self	1,000	0.1%
Subtotal		379,321	51.0%
West Central Region			
Sitka	Municipal System	91,802	12.4%
Angoon	THREA	1,737	0.2%
Tenakee Springs	Municipal System	382	0.1%
Subtotal		93,921	12.6%
Tyee-Swan Region			
Wrangell	Municipal System	25,229	3.4%
Petersburg	Municipal System	36,617	4.9%
Kake	THREA	3,964	0.5%
Ketchikan	Municipal System	142,567	19.2%
Metlakatla	Metlakatla Power & Light	13,543	1.8%
Subtotal		221,920	29.9%
Prince of Wales Region			
Craig/Klawock/Thorne Bay/Kasaan	AP&T	21,355	2.9%
Coffman Cove	AP&T	674	0.1%
Hollis	AP&T	507	0.1%
Hydaburg	AP&T	1,449	0.2%
Naukati Bay	AP&T	382	0.1%
Whale Pass	AP&T	213	0.0%
Subtotal		24,580	3.3%
Totals		743,296	100.0%
Totals - Average MW		84.9	

APPENDIX H, cont.
Needs/Projects for Southeast and Four Dam Pool Communities

The Four Dam Pool projects also include the Terror Lake (22.6 MW) project in Kodiak and the Solomon Gulch (12.0 MW) project in Valdez. The Terror Lake project serves Kodiak and the Solomon Gulch project serves Glennallen, Valdez and the Copper River Basin. These two projects coupled with the Swan Lake and Lake Tyee projects in Southeast comprise the projects now owned by the Four Dam Pool Power Agency.

These projects were purchased from the State of Alaska on January 31, 2002. Members of the Four Dam Pool Power Agency include the City of Ketchikan, the City of Wrangell, the City of Petersburg, Kodiak Electric Association and Copper Valley Electric Association.

A number of sub-regional transmission lines and new hydroelectric resources have been evaluated by the electric utilities in Southeast Alaska. Some of these projects are well into the development process and *are* proposed to be constructed in the near future. These projects are summarized with their assumed on-line dates as follows:

Project	Community/Utility	Projected On-Line Year
Craig - Hollis Transmission Line	AP&T	2003
Craig - Hydaburg Transmission Line	AP&T	2004
Coffman Cove Transmission Line	AP&T	2007
South Fork Hydroelectric Project	AP&T Prince of Wales	2006
Lake Dorothy Hydroelectric Project	AEL&P	2007
Haines - Chilkat Valley Transmission Line	AP&T	2007
Kasidaya Hydroelectric Project	AP&T Upper Lynn Canal	2006
Falls Creek Hydroelectric Project	Gustavus Electric Co.	2008

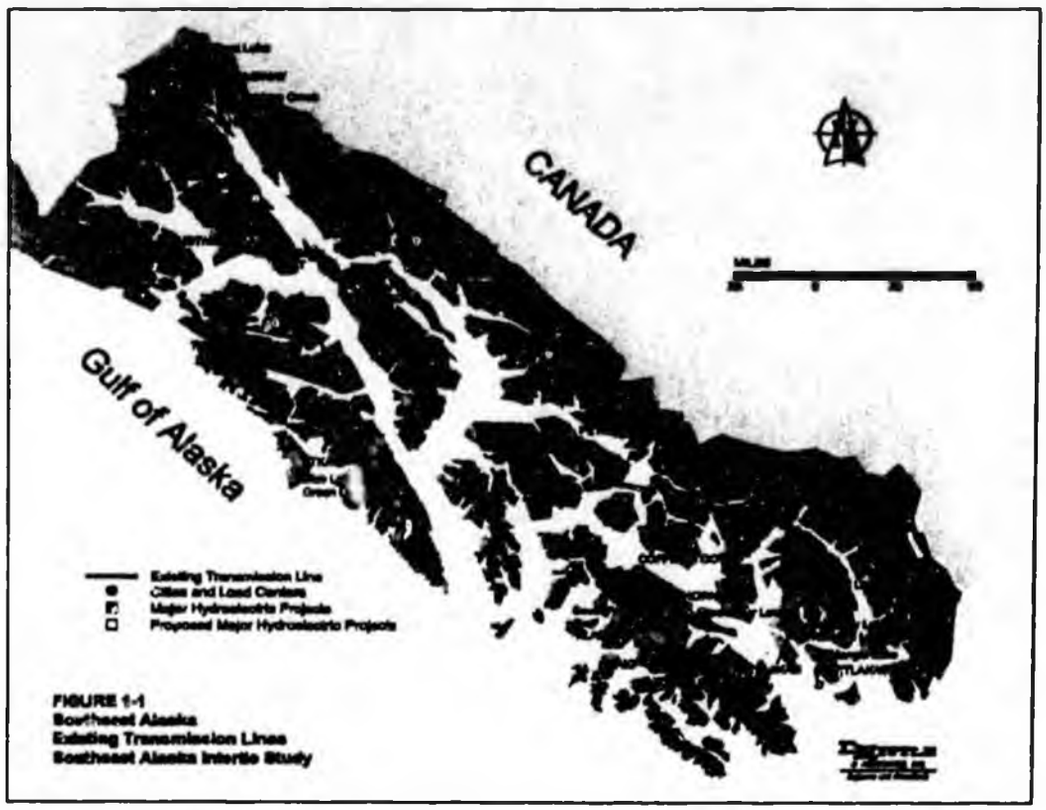
Date shown is dependent on ability to obtain project funding

APPENDIX H, cont.
Needs/Projects for Southeast and Four Dam Pool Communities

Potential New Southeast Alaska Hydroelectric Projects

	Community / Utility	Capacity (kW)	Annual Energy Generation Capability [1] (MWh)	Estimated Capital Cost [2] ($millions)
Upper Lynn Canal Region				
Kasidaya Creek	Haines-Skagway/AP&T	3,000	12,000	7.0
Connelly Lake	Haines-Skagway/AP&T	5,000	30,000	14.0
Subtotal		5,000	30,000	
North Region				
Lake Dorothy - Phase 1	Juneau/AEL&P	15,000	75,000	
Lake Dorothy - Phase 2	Juneau/AEL&P	32,000	94,000	
Gartina Falls	Hoonah	600	1,900	3.8
Water Supply Creek	Hoonah	600	1,800	3.1
Falls Creek	Gustavus/GEC	800	2,500	4.1
Subtotal		49,000	175,200	
West Central Region				
Takatz Lake	Sitka	20,000	82,800	82.0
Katlian River	Sitka	7,000	29,800	70.5
Thayer Creek	Angoon	1,000	8,500	NA
Subtotal		28,000	121,100	
Tyee-Swan Region				
Thomas Bay (Swan Lake)	Petersburg	40,000	164,400	193.0
Lake Tyee Third Turbine	Petersburg - Wrangell	10,000	1,000	NA
Sunrise Lake	Wrangell	4,000	12,200	NA
Anita - Kunk Lake	Wrangell	8,000	28,200	NA
Virginia Lake	Wrangell	12,000	42,700	NA
Thoms Lake	Wrangell	7,300	25,600	NA
Whitman Lake	Ketchikan/KPU	4,600	19,640	7.6
Connell Lake	Ketchikan/KPU	1,900	11,640	5.5
Mahoney Lake	Ketchikan/KEC	9,600	45,600	NA
Triangle Lake	Metlakatla/MP&L	3,900	16,885	12.9
Subtotal		101,300	367,865	
Prince of Wales Region				
South Fork	Craig-Klawock/AP&T	2,000	7,000	3.5
Lake Mellon/Reynolds Creek	Craig-Klawock/AP&T	10,000	-	NA
Subtotal		12,000	7,000	
Totals		195,300	701,165	

APPENDIX H cont.
Needs/Projects for Southeast and Four Dam Pool Communities



Transmission Line Development/Regional Planning:

Except for transmission lines connecting several Prince of Wales Island communities, the Lake Tyee to Wrangell & Petersburg transmission line, and a submarine cable connecting Haines & Skagway, the communities within Southeast Alaska are not currently interconnected.

In 1997, the Southeast Conference Intertie Committee was formed including representation from a broad range of utilities, municipalities and organizations from all over Southeast Alaska. A study was commissioned by Southeast Conference and completed in 1997 by Acres International to evaluate the technical feasibility of an interconnected Intertie system throughout Southeast Alaska. The results of the study served as the basis upon which Congress passed a bill authorizing the project including federal funding participation.

Southeast Conference commissioned an engineering & economic analysis of the Southeast Alaska Intertie Project in 2003. This study was completed by D. Hittle & Associates in 2003. The study provides an update of the original Acres report and includes updated cost estimates and recommended segment phasing. Three transmission segments are currently under varying stages of development

APPENDIX H, cont.

Needs/Projects for Southeast and Four Dam Pool Communities

1. **Swan Lake – Lake Tyee Segment:**

Originally developed by the City of Ketchikan, the project is being transferred to the Four Dam Pool Power Agency. The Agency, owner of the Swan Lake and Tyee Lake generation facilities, will be responsible for all remaining construction activity. This Intertie segment has been several years in development and is now poised for completion. All of the necessary permits are in hand, all but one mile of the 57 mile right-of-way between the Swan Lake and Tyee Lake hydroelectric plants has been cleared, the structure sites have been surveyed and sampled, and final engineering design is nearly complete. The surplus power from Lake Tyee will be used to offset diesel generation in Ketchikan and allow more efficient use of existing generation facilities.

2. **Juneau – Greens Creek Mine – Hoonah Segment:**

The $41 million, 63.5-mile Juneau - Greens Creek Mine – Hoonah segment is coupled with the private development of the $35 million, 15-megawatt Lake Dorothy Hydroelectric project. The first 11 miles of the Intertie – from the Douglas Bridge to North Douglas Island have been completed by Alaska Electric Light & Power. Hydroelectric energy delivered across the Juneau-Greens Creek-Hoonah Intertie will completely replace diesel-generated energy in Hoonah and at the Greens Creek Mine. In Hoonah, the Intertie will displace over 400,000 gallons of diesel fuel annually, supplying hydroelectric energy to 860 residents and 435 homes. In addition, the Intertie will displace over 5 million gallons of diesel fuel used annually to generate electrical energy at the Greens Creek Mine.

3. **Petersburg – Kake Segment:**

The project would involve the construction of between 46 and 59 miles of transmission line (depending on the route selected) interconnecting the communities of Petersburg and Kake. The potential long-term benefits of the Intertie would be to use surplus generation from the Lake Tyee hydroelectric project to offset diesel generation in Kake. Additional benefit is the potential interconnection to the Woewodski Island Mine project that is currently under exploration by Olympic Resources and Bravo Venture Group. This project has promising mineral potential similar to the existing Greens Creek mine near Juneau. The estimated cost of this project is $ 23.1 million dollars if the shortest and most direct route is selected. Most of the line would parallel existing logging roads in the region. Two short submarine cables would probably be required. This segment will be designed for eventual interconnection to Sitka to the West as well as future interconnection to the Juneau – Hoonah segment.

APPENDIX H, cont.
Needs/Projects for Southeast and Four Dam Pool Communities

Routes for transmission lines between the communities of Southeast Alaska have been identified based on previous studies. These routes combine lengthy submarine cables and overhead transmission lines generally through undeveloped areas. The routes for the most part, are included as identified power system corridors in the Tongass National Forest Land Management Plan. The costs to construct and develop each of these lines at current cost levels have been estimated and are summarized as follows:

		Estimated Cost (millions)	Line Length (miles)		
			Sub. Cable	Overhead	Total
SEI - 1	Juneau - KMCGC -Hoonah	$37.1	34.5	18.7	53.2
SEI - 2	Kake - Petersburg	23.1	1.7	49.9	51.6
SEI - 3	Metlakatla - Ketchikan	6.0	1.0	16.0	17.0
SEI - 4	Ketchikan - Prince of Wales	31.7	17.2	18.0	35.2
SEI - 5	Kake - Sitka	50.3	35.0	24.0	59.0
SEI - 6	Hawk Inlet - Angoon - Sitka	81.2	82.0	22.0	104.0
	Less: SEI-6 costs common to SEI-5	(9.5)		(20.0)	(20.0)
SEI - 7	Hoonah - Gustavus	26.4	29.0	1.0	30.0
SEI - 8	Juneau - Haines	69.8	2.8	82.5	85.3
	Total System	**$316.0**	**203.2**	**212.1**	**415.3**

It should be noted that significant alternative configurations and route options exist for SEI-2, SEI-4, SEI-6 and SEI-8 which would change the estimated length and cost of these lines. The various alternatives will need to be evaluated more thoroughly in the future as development of these lines proceeds. Depending on the timing of construction of the Intertie segments, estimated costs will need to reflect the estimated impact of inflation.

Electric loads in Southeast Alaska are forecasted to increase at approximately 1% per year. Some communities are expected to see slightly higher rates of growth in the next - few years due to expanded economic activity in their areas. The potential for noticeable increases in energy requirements exists, however, particularly due to possible new mining operations.

The planned additions of new small hydroelectric facilities and the relatively slow growth expected in electrical loads reduces the near-term benefits that could be realized with Interties between certain communities.

APPENDIX H, cont.

Needs/Projects for Southeast and Four Dam Pool Communities

An evaluation of the costs and benefits of the Intertie segments has been prepared to determine when the savings in diesel energy generation production expenses would exceed the costs of purchasing and delivering power over the Interties. The results of this analysis indicate when new Intertie segments would

be considered "economically justifiable". The recommended timing of the new Intertie segments, as determined by this analysis, is as follows:

		Projected On-Line Year
SEI - 1	Juneau - KMCGC - Hoonah	2007
SEI - 2	Kake - Petersburg	2007
SEI - 3	Metlakatla - Ketchikan	2015-2020
SEI - 4	Ketchikan - Prince of Wales	2020-2025
SEI - 5	Kake - Sitka	2025-2030
SEI - 6	Hawk Inlet - Angoon - Sitka	2020-2025
SEI - 7	Hoonah - Gustavus	After 2030
SEI - 8	Juneau - Haines	After 2030

The estimated cost of the total Southeast Intertie system is shown in Table 5-11. For the most part, the costs included in Table 5-10 do not acknowledge any cost savings that could possibly occur if several components of the system were to be constructed concurrently. Significant savings could potentially be realized if multiple submarine cable crossing systems were installed at the same time.

TABLE 5-11
Estimated Cost of Project Development and Construction
Southeast Alaska Intertie System

SEI - 1	Juneau - KMCGC - Hoonah	$ 37,076,000
SEI - 2	Kake - Petersburg	23,073,700
SEI - 3	Metlakatla - Ketchikan	5,962,400
SEI - 4	Ketchikan - Prince of Wales	31,693,000
SEI - 5	Kake - Sitka	50,345,800
SEI - 6	Hawk Inlet - Angoon - Sitka	81,193,400
	Less: SEI-6 costs common to SEI-5	(9,506,000)
SEI - 7	Hoonah - Gustavus	26,372,200
SEI - 8	Juneau - Haines	69,779,000
	Total System	**$ 315,989,500**

The total estimated cost of the system is $316.0 million. Of this amount, approximately $7.0 million is for inclusion of fiber optic systems in both the submarine and overhead portions of the transmission lines.

The total estimated cost is significantly less than the $435.8 million indicated in the 1997 Southeast Alaska Electrical Intertie System Plan. The 1997 Plan amount included $69.8 million for the Tyee-Swan Intertie that is not included in Table 5-11. The 1997 Plan also included approximately $55.5 million more for the interconnection between Juneau, Hoonah and Sitka than is indicated for SEI-1 and SEI-6 in total in Table 5-11, above.

Appendix I
FY03 PCE Program Participating Utilities

Akhiok, City of
Aklachak Native Community
Aklak, City of
Akutan Electric Utility
Alaska Power Company
Allakaket/Alatna
Bettles/Evansville
Chistochina
Coffman Cove
Craig
Dot Lake
Eagle/Eagle Village
Haines
Healy Lake
Hollis
Hydaburg
Klawock
Mentasta
Naukati
Northway/Northway Village
Skagway
Tetlin
Thorne Bay/Kassan
Tok
Whale Pass
Alaska Village Electric Cooperative
Alakanuk
Ambler
Anvik
Brevig Mission
Chevak
Eek
Elim
Emmonak
Gambell
Goodnews Bay
Grayling
Holy Cross
Hooper Bay
Huslia
Kaltag
Kasigluk
Kiana
Kivalina
Koyuk
Lower Kalskag
Marshall
Mekoryuk
Minto
Mt. Village
New Stuyahok
Nightmute
Noatak
Noorvik
Nulato
Nunapitchuk
Old Harbor
Pilot Station
Pitka's Point
Quinhagak
Russian Mission
Savoonga
Scammon Bay
Selawik
Shageluk
Shaktoolik
Shishmaref
Shungnak
St. Mary's/Andreafsky
St. Michael
Stebbins
Togiak
Toksook Bay
Tununak
Upper Kalskag
Wales
Alutiiq Power Company
Karluk
Andreanof Electric Corporation – Atka
Aniak Light & Power Company
Atmautluak Joint Utilities
Beaver Joint Utilities
Bethel Utilities Corp.
Bethel
Oscarville
Buckland, City of
Central Electric, Inc.
Chenega Bay IRA Village
Chignik Electric
Chignik Lagoon Power Utilities
Chignik Lake Electric Utility
Chitina Electric Inc.
Circle Electric Utility
Cordova Electric Co-op
Diomede Joint Utilities
Eyegik Light & Power
Ekwok Electric
Elfin Cove Electric Utility
False Pass Electric Association
G & K
Cold Bay
Galena, City of
Golovin Power Utilities
Gustavus Electric Company
Gwitchyaa Zhee Utilities
Ft. Yukon
Hughes Light & Power
Igiugig Electric Company
I-N-N Electric Cooperative
Iliamna
Newhalen
Nondalton
Ipnatchiaq Electric Company
Deering
King Cove, City of
Kipnuk light Plant
Kobuk Valley Electric Company
Kokhanok Village Council
Koliganek Village Council
Kotlik Electric Services
Kotzebue Electric Association
Koyukuk, City of
Kwethluk, Inc.
Kwig Power Company
Kwigillingok
Larsen Bay Utility Company
Levelock Electric Cooperative
Lime Village Electric Company
Manley Utility Company
Manokotak Power Company
McGrath Light & Power
Middle Kusko. Electric Coop
Chathbaluk
Crooked Creek
Red Devil
Sleetmute
Stony River
Naknek Electric Association
Naknek
South Naknek
King Salmon
Napakiak Ircinraq Power Company
Napaskiak Electric Utility
Nataraq Light Plant
Chefornak
Nelson Lagoon Electric Cooperative
Nikolai Light & Power
Nome Joint Utility System
North Slope Borough
Anaktuvuk Pass
Atqasuk
Kaktovik
Nuiqsut
Point Hope
Point Lay
Wainwright
Nunam Iqua Electric Company
Nushagak Electric Cooperative
Dillingham
Aleknagik
Ouzinkie, City of
Pedro Bay Village Council
Perryville, City of
Pilot Point Electrical
Platinum, City of
Port Heiden, City of
Puvurnaq Power Co
Kongiganak
Ruby, City of
Sand Point Electric Co.
St. George MuniElectrUtility
St. PaulMuniElectrUtility
Takotna Comm Assoc. Utilities
Tanalian Electric Coop.
Port Alsworth
Tanana Power Company
Tatitlek Electric Utility
Teller Power Company
Tenakee Springs, City of
Tlingit Haida Reg Elect Auth
Angoon
Chilkat Valley
Hoonah
Kake
Klukwan
Tuluksak Tradit Power Utility
Tuntutuliak Comm Service
Twin Hills Village Council
Umnak Power Company
Nikolski
Unalakleet Valley Electric Coop
Unalaska Electric Utility
Unguraq Power Company
Newtok
Venetie Village Electric
White Mountain Utilities
Yakutat Power

FY03 PCE PROGRAM STATISTICS

Participation Statistics	Fiscal Year 2003	Fiscal Year 2002	Percent Change 2002 - 2003
Population Served	79,229	79,555	-0.4%
Communities Served	185	187	-1.1%
Participating Utilities	89	90	-1.1%
Total Residential Customers	25,713	25,495	0.9%
Total Eligible Community Facilities Customers	1,776	1,746	1.7%
Total Eligible Customers	27,489	27,241	0.9%
Production Statistics			
Total Diesel Generation (kWh)	370,976,960	386,658,693	-4.1%
Total Hydroelectric Generation (kWh) (1)	25,599,909	7,889,500	224.5%
Total Purchased Power (kWh)	45,840,367	45,755,222	0.2%
Total kWh Sold (All Customers) (2)	403,156,646	401,804,401	0.3%
PCE Eligible kWh - Residential	89,786,393	89,314,504	0.5%
PCE Eligible kWh - Community Facilities	33,828,803	34,342,099	-1.5%
Total PCE Eligible kWh shown as percent of total kWh sold.	31%	31%	0.0%
Average Monthly PCE Eligible kWh - Residential Customers (3)	291	293	-0.7%
Average Monthly PCE Eligible kWh - Community Facilities	1,587	1,645	-3.5%
Average Monthly PCE Eligible kWh - Community Facilities / Per Resident	36	36	0.0%
Financial Statistics			
Average Price of Fuel Oil ($/gallon)	1.33	1.32	0.8%
Total Fuel Oil Consumed (gallons)	27,295,935	28,161,794	-3.1%
Total cost of fuel purchased by the utilities ($)	36,400,050	37,059,110	-1.8%
Total Operating Costs ($)	59,003,506	57,169,071	3.2%
Operating expenses per total kWh sold ($)	0.1464	0.1410	3.8%
PCE legislative funding appropriations ($)	15,700,000	15,700,000	0.0%
Total PCE payments ($) (4)	15,448,480	15,469,105	-0.1%
Average PCE payment per eligible kWh ($)	0.1250	0.1251	-0.1%
Average annual required PCE payment per customer ($) (3)	562	569	-1.2%

(1) Substantial increase in hydro generation due to the production of Cordova's Power Creek hydro facility.
(2) Value reduced by 3,194,515 kWh's in FY02, and by 1,063,387 in FY03 to eliminate double counting of kWh's where power is bought and sold between utilities participating in the PCE Program.
(3) Calculation assumes all customers were eligible to receive twelve (12) months of PCE credit.
(4) During FY03 PCE payments were made at a 84% level for the first eight (8) months, and at a 90% level for the next three (3) months, and at a 92% level for the last month.

PCE PROGRAM
HISTORICAL TRENDS
Fiscal Year 1993 - 2003

	Fiscal Year 1993	Fiscal Year 1994	Fiscal Year 1995	Fiscal Year 1996	Fiscal Year 1997
PARTICIPATION					
Participating Utilities	96	95	95	96	96
Communities Served	166	173	175	180	191
Population Served	69,626	73,392	75,778	75,488	77,408
CUSTOMERS					
Residential	20,857	21,732	22,361	23,316	23,820
Commercial	5,363	5,202	5,299	6,391	5,778
Community Facilities	1,285	1,366	1,361	1,452	1,510
Total Customers	27,505	28,300	29,021	31,159	31,108
FUNDING					
Appropriations ($)	$18,026,700	$17,920,000	$18,635,000	$19,385,600	$18,500,000
Disbursements ($)	$17,341,042	$17,516,024	$18,493,448	$19,201,515	$17,906,275
Disbursements/Customer ($)	$630	$619	$637	$616	$576
Funding Level (Annual Average % of full PCE rates)	89.17%	95%	97.5%	97.5%	85%
CONSUMPTION					
Total MWH Sold (MWH)	313,535	340,102	359,569	363,783	374,455
PCE Eligible MWH Residential & Commercial (6)	104,545	105,630	108,217	112,484	115,803
PCE Eligible KWH/Month/Customer, Residential& Commercial	332	327	326	316	326
PCE Eligible MWH Community Facilities	23,331	24,34[illegible]	26,447	27,420	28,308
Eligible KWH/Month/Capita, Community Facilities	28.0	28.0	29.0	30.0	31.0
Total PCE Eligible MWH (MWH)	127,877	129,974	134,194	139,904	144,112
Eligible KWH/Month/Customer, Total Customers	388	383	385	374	386
COSTS					
Average Price of Fuel Oil ($/gallon)	$0.990	$0.970	$1.010	$1.01	$1.11
Total Gallons of Fuel Oil Consumed (gallons)	24,932,287	26,663,700	27,861,416	27,540,292	28,159,435
Total Cost of Fuel Oil ($)	$25,246,066	$27,391,271	$27,616,949	$27,849,969	$31,174,864
Total Operating Costs ($)	$43,974,601	$48,431,445	$47,200,227	$52,174,734	$51,069,505
EFFICIENCY RATIOS					
Operating Expenses per total KWH Sold ($/kWh)	$0.1400	$0.1270	$0.1310	$0.1430	$0.1360
RATES					
Average PCA/PCE per Eligible KWH ($/kWh)	$0.1350	$0.1350	$0.1380	$0.1370	$0.1240

(1) Commercial customers are ineligible to receive PCE credit, per July 2000 legislation.

(2) PCE funding levels for FY99 were paid at the a reduced level of 85% for the first ten (10) months of the program year, and reduced to 73.5% for the last two (2) months of the program year.

(3) PCE funding levels for FY01 were paid at the 100% level for the first eleven (11) months, and reduced to 74% for the last month of the program year.

(4) PCE funding levels for FY02 were paid at the reduced level of 92% for the first seven (7) months, 80% for the next four (4) months, and 66% for the last month of the program year.

(5) PCE funding levels for FY03 were paid at the reduced level of 84% for the first eight (8) months, 90% for the next three (3) months, and 92% for the last month of the program year.

(6) PCE Eligible MWH Residential & Commercial is a combined total for years FY89 - FY99. FY00 - FY03 represents residential eligible MWH's only.

PCE PROGRAM
HISTORICAL TRENDS, cont.
Fiscal Year 1993 - 2003

	Fiscal Year 1998	Fiscal Year 1999	Fiscal Year 2000	Fiscal Year 2001	Fiscal Year 2002	Fiscal Year 2003
PARTICIPATION						
Participating Utilities	97	98	94	91	90	89
Communities Served	193	194	188	189	187	185
Population Served	78,179	79,377	77,625	79,708	79,555	79,229
CUSTOMERS						
Residential	24,423	25,226	24,753	25,123	25,426	25,713
Commercial	5,895	5,955	(1)	(1)	(1)	(1)
Community Facilities	1,609	1,627	1,675	1,732	1,740	1,776
Total Customers	31,927	32,808	26,428	26,855	27,166	27,489
FUNDING						
Appropriations ($)	$18,700,000	$18,050,000	$15,700,000	$17,090,222	$15,700,000	$15,700,000
Disbursements ($)	$18,503,992	$17,949,524	$14,415,676	$17,076,203	$15,469,105	$15,448,480
Disbursements/Customer ($)	$580	$547	$545	$636	$569	$562
Funding Level (Annual Average % of full PCE rates)	85%	(2)	100%	(3)	(4)	(5)
CONSUMPTION						
Total MWH Sold (MWH)	383,549	403,663	391,454	390,802	401,804	403,157
PCE Eligible MWH Residential & Commercial (6)	118,553	128,836	85,873	87,524	89,315	89,786
PCE Eligible KWH/Month/Customer, Residential & Commercial	326	364	265	290	293	291
PCE Eligible MWH Community Facilities	29,954	33,016	30,216	33,062	34,342	33,829
Eligible KWH/Month/Capita, Community Facilities	32.0	35.0	32.4	35.0	36.0	36.0
Total PCE Eligible MWH (MWH)	148,507	161,852	116,089	120,585	123,657	123,615
Eligible KWH/Month/Customer, Total Customers	388	411	293	325	379	327
COSTS						
Average Price of Fuel Oil ($/gallon)	$1.07	$0.98	$1.10	$1.37	$1.32	$1.330
Total Gallons of Fuel Oil Consumed (gallons)	28,380,048	28,296,365	27,697,657	27,358,835	28,161,794	27,295,935
Total Cost of Fuel Oil ($)	$30,235,332	$27,701,300	$30,427,210	$37,547,880	$37,059,110	$36,400,050
Total Operating Costs ($)	$53,803,848	$54,539,372	$41,467,005	$55,436,898	$57,169,071	$59,003,506
EFFICIENCY RATIOS						
Operating Expenses per total KWH Sold ($/kWh)	$0.1400	$0.1350	$0.1060	$0.1410	$0.1410	$0.1464
RATES						
Average PCA/PCE per Eligible KWH ($/kWh)	$0.1250	$0.1450	$0.1240	$0.1416	$0.1251	$0.1250

(1) Commercial customers are ineligible to receive PCE credit, per July 2000 legislation.

(2) PCE funding levels for FY99 were paid at the a reduced level of 85% for the first ten (10) months of the program year, and reduced to 73.5% for the last two (2) months of the program year.

(3) PCE funding levels for FY01 were paid at the 100% level for the first eleven (11) months, and reduced to 74% for the last month of the program year.

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(5) PCE funding levels for FY03 were paid at the reduced level of 84% for the first eight (8) months, 90% for the next three (3) months, and 92% for the last month of the program year.

(6) PCE Eligible MWH Residential & Commercial is a combined total for years FY89 - FY99. FY00 - FY03 represents residential eligible MWH's only.

Appendix J
Alaska Energy Policy Task Force Members

Chair: Mike Barry, Chairman of the Board
AIDEA/Alaska Energy Authority (AEA)
www.aidea.org

Vice Chair: H.A. Red Boucher, Alaska Wireless Technology
Board Member, Chugach Electric Association (CEA)
www.chugachelectric.com

Tom Boutin, Deputy Commissioner
State of Alaska-Department of Revenue
www.state.ak.us

Dave Carlson, Intertie Coordinator
Southeast Conference
www.seconference.org

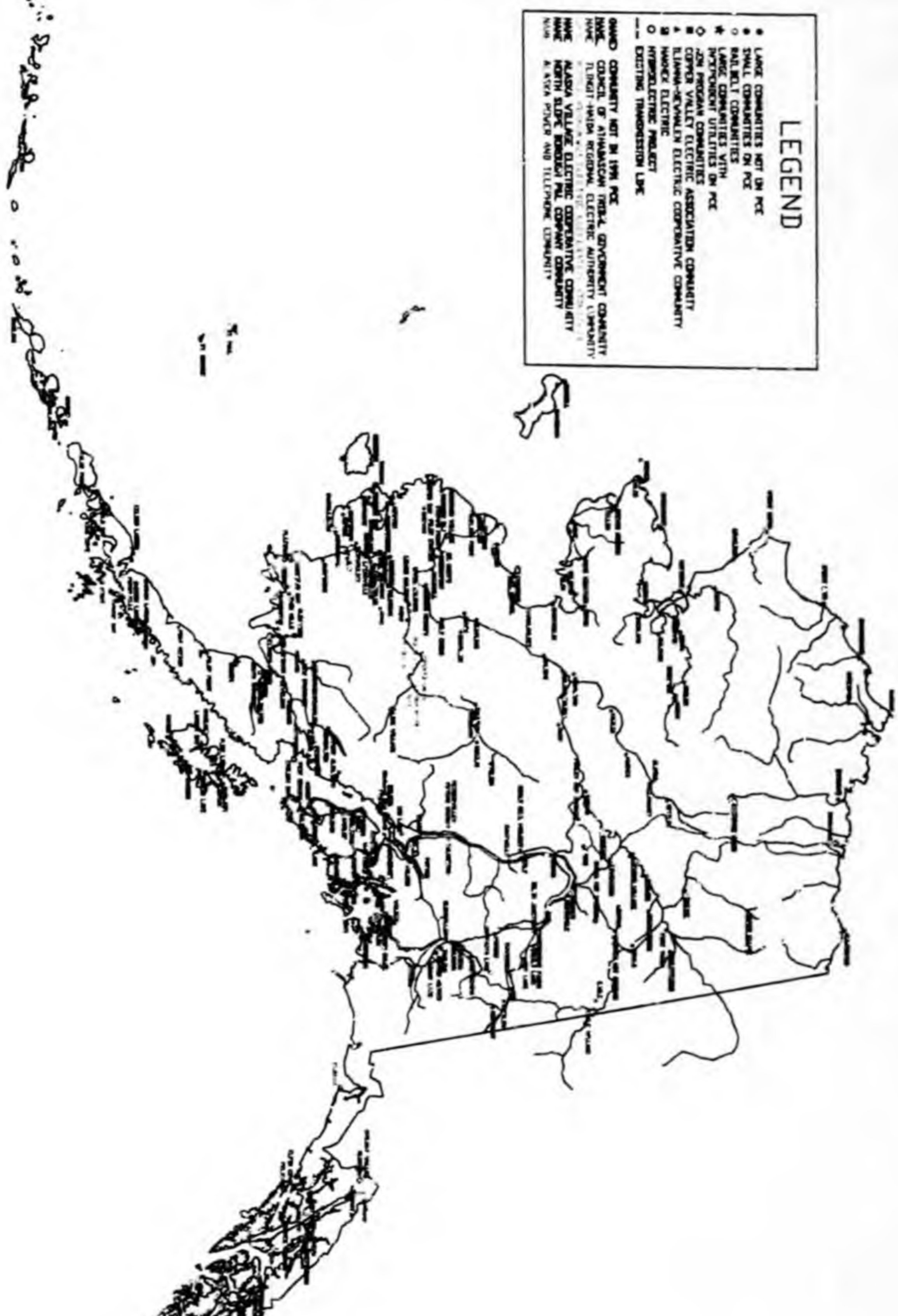
Wayne Carmony, General Manager
Matanuska Electric Association (MEA)
www.matanuska.com

Rick Eckert, Manager of Finance
Homer Electric Association (HEA)
www.homerelectric.com

Steve Haagenson, President/CEO
Golden Valley Electric Association (GVEA)
www.gvea.com

Meera Kohler, President/CEO
Alaska Village Electric Cooperative (AVEC)
www.avec.org

Robert Wilkinson, CEO
Copper Valley Electric Association (CVEA)
www.cvea.org


LEGEND
LARGE COMMUNITIES NOT ON PCE
SMALL COMMUNITIES ON PCE
RAILBELT COMMUNITIES
LARGE COMMUNITIES WITH INDEPENDENT UTILITIES ON PCE
AEA PROGRAM COMMUNITIES
COPPER VALLEY ELECTRIC ASSOCIATION COMMUNITY
NAKNEK ELECTRIC
HYDROELECTRIC PROJECT
EXISTING TRANSMISSION LINE
COMMUNITY NOT IN 1991 PCE
ALASKA VILLAGE ELECTRIC COOPERATIVE COMMUNITY
ALASKA POWER AND TELEPHONE COMMUNITY