Reliable and Affordable Energy For Rural Alaska

September 17-19, 2002
River's Edge Resort
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Proceedings

Sponsored by

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Editor's notes

Identification code for the presentations:
A five character alphanumeric code precedes the title of each presentation listed. For example the code for the King Cove Hydroelectric Project presentation is RE1B2. The letters "RE" identify it as a Reliable and Affordable Energy Conference document, the numeral "1" indicates the first technical session, the letter "B" indicates the section of the 1st session it was presented in, and the numeral "2" indicates the that it was the 2nd presentation of that section.

The presentations that were not submitted as "PowerPoint" presentations are not contained in these preceedings.

TUESDAY, September 17, 2002

Keynote Addresses: ***The Social and Economic Environment*** **Miners Hall**

Welcoming Remarks	Marshal Lind, Chancellor, University of Alaska Fairbanks
Energy to Rural Alaska	Fran Ulmer, Lieutenant Governor, State of Alaska
The Role of the University in Addressing Alaska's Energy Needs	Mark Hamilton, President, University of Alaska
From the Gold Rush to Today: the History of Energy in Alaska	Neil Davis, Professor Emeritus, UAF

Plenary Session: ***Past and Current Energy Issues in Alaska*** **Miners Hall**

The first Alaskans depended on wildlife and wood for energy--now Alaska is a major world exporter of fossil fuels. This session summarizes the changes Alaska has undergone and lays out basic information on current energy production and consumption.

Economics & Demographics: Who We Are & How We are Changing	Neal Fried, Labor Economist, State of Alaska - Dept. of Labor
Alaska's Rural Utilities	T.C. Wilson, Director of Safety and Engineering Services, ARECA, and also, Executive Director, ASCC
Conversion: Where Does Alaska's Electricity Come From?	Steve Colt, Associate Professor of Economics, ISER

Technical Session 1

1A: Diesel Electric Generator Power Plant Virtual Tour **Miners Hall North**

A number of high performance diesel power plants operate in Alaska. There are different approaches to building and operating these plants--the standardized plants of the North Slope Borough, AVEC's new modular plants, the kit plants of the Alaska Energy Authority, and the slimmed-down operations of Alaska Power & Telephone and Tanana Power. Come take a "virtual" tour.
Chair: T.C. Wilson, Director of Safety and Engineering Services, ARECA and Executive Director, ASCC

RE1A1	AP&T Power Plants in Alaska	Eric Hannan, Manager of Power Operations – Tok Region, Alaska Power & Telephone.
RE1A2	Standardization of Power Plants on the North Slope	Harold Snowball, Deputy Utility Director, North Slope Borough
RE1A3	New Modular Power Plant Designs	Mark Teitzel, Manager of Engineering, AK Village Electric Cooperative
RE1A4	Alaska Energy Authority Experience in Community Power Systems	Kris Noonan, Program Manager, Alaska Energy Authority

1B: Hydro Power: Existing Projects **Miners Hall South**

Over fifty hydroelectric plants are operating in Alaska, many of them in rural areas. This session discusses some of the recent successful rural hydroelectric projects--how they are running and what it took to develop them.
Chair: Brent Petrie, Manager, AVEC

RE1B1	Power Creek Hydro	Clay Koplin, Manager of Engineering, Cordova Electric Cooperative
RE1B2	King Cove Hydro Project	Bob Butera, Engineer, HDR Inc.
RE1B3	Black Bear Lake & Goat Lake Hydro Projects	Bob Grimm, President, AP&T

1C: Natural Gas **Prospector Room**

Over the last decade there has been significant interest in developing local natural gas and coal resources for small-scale power and heat production. This session addresses the steps needed to develop, transport, and utilize small gas deposits.
Chair: Charles Thomas, Science Applications International Corporation (SAIC), Arctic Energy Office

RE1C1	The In-state Route for a Natural Gas Pipeline	Greg Bidwell, Petroleum Economist, AK. Dept of Revenue
RE1C2	Lesson Learned: LNG in Fairbanks	Dan Britton, Fairbanks Natural Gas
RE1C3	Clean Diesel Fuels	Steve Woodward, Syntroleum Corporation

1D: Utility Management **Meeting Room Suite**

This session discusses some of the management alternatives for lowering utility costs and enhancing sustainability—including utility service consolidation, fuel purchasing coops, and business planning.
Chair: Scott Ruby, Manager Rural Utility Business Assistance Program, Division of Community & Business Development, DCED

RE1D1	Lower Yukon Mayors, Bulk Fuel Co-op	Walton Smith, City Manager, Saint Mary's
RE1D2	Regional Utility Services of Alaska	Bill Gordon, President, Utility Services of Alaska
RE1D3	The PCE Program: History, Changes and Trends	Terri Harper, PCE Program Administrator, AEA
RE1D4	Business Plans	Jolene John, Development Specialist, AEA
RE1D5	Bulk Fuel Management	Meera Kohler, President & CEO, AVEC

TUESDAY, September 17, 2002

Technical Session 2

2A: Diesel Efficiency **Miners Hall North**

Over the last 15 years, rural Alaskan power systems have consistently improved reliability and performance. Recent advances in technology provide potential for further improvement. This session addresses the technology being developed to increase diesel power generation efficiency, including plant automation and control and high-efficiency gen-sets.

Chair: Chuck Craig, Associate Professor of Diesel Technology, University of Alaska – Southeast

RE2A1	Economics of Diesel Efficiency	Mark Foster, Principal, MAFA
RE2A2	Detroit Series 60: Increasing Fuel Efficiency	Mark Teitzel, Manager of Engineering, AVEC
RE2A3	Automated Switchgear: Increasing Efficiency Through Better Control	Dan Rogers, Principle Engineer, Electric Power Systems, Inc
RE2A4	Blending Waste Oil to Increase Efficiency	Otto Jakobi, Global Energy Recovery

2B: Hydro Power: A Look to the Future **Miners Hall South**

This session continues the earlier discussion of recent successful hydro projects, addresses integration with diesel systems, and describes current projects that seek to harness energy from tidal changes and stream flow.

Chair: Peter Crimp, Development Specialist, AEA

RE2B1	Hydro-Diesel Frequency Control	Larry Clifton, Clifton Labs
RE2B2	Feasibility Analysis of Tidal Power	Nick Goodman, Northern Renewables, LLC
RE2B3	Run-of-River Hydro Project for Eagle, AK	Phillipe Vauthier, President, UEK

2C: Natural Gas and Coal **Prospector Room**

Coal is a well-established energy source in Alaska. This session discusses coal availability and cost and feasibility of small-scale coal-fired power and heat generation. The session also describes current efforts develop local coal bed methane resources and convert natural gas into a liquid synthetic fuel.

Chair: Charles Thomas, Science Applications International Corporation (SAIC), Arctic Energy Office

RE2C1	The Cost of Delivered Coal for Rural Communities	Pat Burden, Northern Economics
RE2C2	Small Coal Combustion Feasibility Analysis	Jim Strandberg, Commissioner, Regulatory Commission of Alaska
RE2C3	Coal Bed Methane for Remote Villages	Jim Clough, Energy Program Manager, Dept. of Natural Resources

2D: Environmental Issues **Meeting Room Suite**

There are many environmental issues associated with providing energy in rural Alaska, including fuel spill remediation, spill prevention, emissions, noise, and indoor air quality. This session will focus on potential solutions to these issues.

Chair: Chris Mello, Program Manager, AEA

RE2D1	Decommissioning Old Tanks and Remediation	John Carnahan, Section Manager, Alaska DEC
RE2D2	Environmental Management	Bill Stokes, Environmental Specialist, Alaska DEC
RE2D3	Regulations Regarding Fuel Delivery	Chris Woody, Lt. Comander, US Coast Guard
RE2D4	Fuel Delivery	Shaen Tarter, Yukon Fuels
RE2D5	Ultra Low Sulfur Diesel	Clint Farr, Environmental Specialist, Alaska DEC

WEDNESDAY, September 18, 2002

Plenary Session: ***The Role of Alaskan Organizations*** **Miners Hall**

Research at the University of Alaska	Craig Dorman, Vice President of Research, University of Alaska
Research at the University of Alaska Fairbanks	Paul Reichardt, Provost, UAF
Research at the University of Alaska Anchorage	Jim Chapman, Provost, UAA
The Denali Commission Plans for Building Stronger Communities	Jeff Staser, Federal Co-Chair, Denali Commission
AEA's Role in Rural Energy	Mike Harper, Deputy Director – Rural Energy, AIDEA
Regulating Rural Utilities	Nan Thompson, Chair, Regulatory Commission of Alaska
Summary of Rural Energy Plan	Mark Foster, Principal, MAFA

Technical Session 3

3A: Diesel Manufacturers Forum **Miners Hall North**

Diesel engines continue to improve in reliability, efficiency, and in emissions reductions. This session reports on what is new for a number of manufacturers.

Chair: John Cameron, Vice President, Precision Power, LLC

RE3A1	Cummins Diesel Power System Products	Troy Lockes, Cummins Northwest
RE3A2	John Deere Power System Products	Jim Payton, John Deere
RE3A3	Detroit Diesel Power System Products	Mike Atchley, Pacific Detroit Diesel
RE3A4	Caterpillar Power System Products	Gary Hirschberg, Caterpillar

3B: Wind Power in Remote Villages **Miners Hall South**

Wind power is becoming economically competitive in grid-connected applications, but is more problematic in off-grid applications where load management issues need to be addressed. This session addresses current wind energy projects in Alaska.

Chair: Brad Reeve, General Manager, Kotzebue Electric Association

RE3B1	Rural Energy Plan for Wind	Mark Foster, Principal, MAFA
RE3B2	Kotzebue Wind Project	Brad Reeve, General Manager, Kotzebue Electric Association
RE3B3	High Penetration Wind Diesel Architecture	Lawrence Mott, Northern Power Systems
RE3B4	Northwind 100 Turbine Test in Kotzebue	Greg Kingsley, Pilot Point Traditional Council and Lawrence Mott, Northern Power Systems
RE3B5	Small Wind Systems in Ambler & Pilot Point	David Blecker, Earth Energy Systems
RE3B6	Chugach Wind Project Analysis	Steve Gilbert, Chugach Electric Association

3C: Biomass Energy **Prospector Room**

Wood continues to be an important rural fuel. Interest continues in using biomass (wood, fish waste products, or agricultural products) to generate power. This session addresses current and planned projects in Alaska.

Chair: Peter Crimp, Development Specialist, AEA

RE3C1	Dot Lake Tick Fired System	Bill Miller, President, Dot Lake Village Council
RE3C2	Wood Chip Fired Boiler System	Joel Florian, Supervisor, Sapa Greenhouses
RE3C3	Wood Gasifier for Remote Power Generation	Richard Bain, NREL
RE3C4	Fish Oil as a Substitute for Diesel Fuel	John Steigers, Vice President, Steigers Corporation

3D: Energy Conservation **Meeting Room Suite**

End use efficiency is among the most cost-effective alternatives for reducing energy costs in rural Alaska. This session addresses current and planned programs.

Chair: Rebecca Garrett, Program Manager, AEA

RE3D1	The Psychology of Conservation/Rebuild America	Ken Baker, Consultant, Aspen Systems
RE3D2	Energy Star Program	Heather Mulligan, Program Manager, US DOE
RE3D3	GVEA Programs for Consumers	Todd Hoener, Program Manager, GVEA
RE3D4	Performance Contracting in State Facilities	Joel St. Aubin, Engineer, DOT-Public Facilities
RE3D5	Weatherization in Rural Villages	Mimi Burbage, Program Manager, AHFC, and Scott Waterman, Energy Specialist, AHFC

WEDNESDAY, September 18, 2002

Technical Session 4

4A: Diesel Fuel **Miners Hall North**

Diesel fuel is the primary source of energy for heat and electrical power generation in rural Alaska. This session will cover fuel characteristics, the impacts of ultra-low sulfur diesel on fuel transportation and storage, and delivery by plane and barge.
Chair: David Lockard, Technical Engineer, AEA

RE4A1	Low Sulfur Diesel	Clint Farr, Environmental Specialist, DEC
RE4A2	Air Delivery of Fuel	Ron Clemm, Director of Operations, Everts Air Fuel
RE4A3	Barge Fuel Deliveries	Matt Sweetsir, Yutana Barge Lines
RE4A4	Diesel Fuel: How is it made and What Do the Specifications Mean?	Bill Boycott, Director of Refining, Williams Refinery
RE4A5	Barge Fuel Deliveries	Dan Hodges, Terminal Manager, Kotzebue

4B: Hybrid Systems and Batteries **Prospector Room**

Energy storage systems are a key component in systems that supply fluctuating electrical loads with variable energy sources such as wind and solar. This session describes a number of current systems.
Chair: Dennis Meiners, Development Specialist, AEA

RE4B1	Small Scale Hybrid Systems for Remote Power Generation	Jim Norman, Alaska Battery Systems
RE4B2	Battery Backup System for Fairbanks	Tim DeVries, GVEA
RE4B3	Overview of Battery Energy Storage	John Boyes, Manager, Sandia National Lab
RE4B4	Lime Village Solar-Battery-Diesel Hybrid: a Test Site for Hybrid Simulations	Ernie Baumgartner, General Manager, McGrath Light & Power

4C: The Healy Clean Coal Project **Miners Hall South**

Completed in November, 1997, the Healy Clean Coal Project has not yet begun commercial operation. This session will deal with the technical, operational, and financial issues associated with the project.
Chair: Dennis Witmer, Acting Director AEDTL, UAF

RE4C1	GVEA Perspective	Kate Lamal, Vice President of Power Supply, GVEA
RE4C2	AIDEA Perspective (non digital presentation)	Dennis McCronhan, Consultant, DVM_INC
RE4C3	Usibelli Perspective	Steve Denton, General Manager, Usibelli Coal Mine

Technical Session 5

5A: Bulk Fuel Storage Projects **Miners Hall North**

Federal and state agencies spend tens of millions of dollars annually upgrading bulk fuel storage facilities in rural Alaska. This session will describe projects completed to date, tank farm design issues, and plans for future tank farm project development.
Chair: David Lockard, Technical Engineer, AEA

RE5A1	The Design, Construction & Maintenance of Bulk Fuel Storage Facilities	Brian Gray, Engineer, Alaska Energy & Engineering
RE5A2	Fueling From Barges	Matt Sweetsir, Yutana Barge Lines
RE5A3	AVEC Bulk Fuel Tank Farm Program	Brent Petrie, Manager, AVEC
RE5A4	Transition to Low Sulfur Fuels	Clint Farr, Environmental Specialist, DEC

5B: Fuel Cells **Miners Hall South**

Much recent interest has been shown in the use of fuel cells for providing electrical power in remote places. This session will address the current status of fuel cell technologies, with a special emphasis on current and planned projects in Alaska.
Chair: Dennis Witmer, Acting Director, AEDTL, UAF

RE5B1	Solid Oxide Fuel Cells for Remote Power	Jim Buckley, Consultant, Energy Alternatives
RE5B2	Diesel Reforming for Fuel Cell Applications	Lyman Frost, INEEL
RE5B3	Fuel Cells in Utilities: Lessons Learned	Steve Gilbert, Maintenance Supervisor Electrical and Controls, Chugach Electric Association
RE5B4	Fuel Cells for Remote Applications in Alaska	Dennis Witmer, Acting Director, AETDL, UAF

WEDNESDAY, September 18, 2002

Technical Session 5 *cont'd.*

5C: Transmission **Prospector Room**

Electrical grid systems use low cost centralized power generation distributed using electrical transmission systems. However, the long distances, unstable soils, and small markets have limited the use of this system in remote Alaska. This session will address current and potential interties, costs, and maintenance issues.

Chair: Brian Hickey, Director of Technical Services, Chugach Electric Association

RE5C1	Southern Intertie	Dora Gropp, Manager, Transmission and Special Projects, Chugach Electric Association
RE5C2	Haines-Skagway Submarine Cable	Bob Grimm, President, AP&T
RE5C3	Interties at AVEC	Mark Teiztel, Vice President, AVEC
RE5C4	Single Wire Ground Return Intertie for the Kuskokwim	Frank Bettine, Bettine Engineering

5D: Financing **Meeting Room Suite**

Finding the funds for projects in remote Alaska is frequently a major hurdle that must be overcome. This will be a discussion of financing issues for rural power projects.

Chair: Sue Weimer, Acting Deputy Director – Credit, AIDEA

RE5D1	Bulk Fuel and Power Project Loans	Sue Weimer, Acting Deputy Director – Credit, AIDEA
RE5D2	Collections	Georgia Shaw, Manager, Member Service, AVEC
RE5D3	Financial Management for Small Utilities	Scott Ruby, Local Government Specialist, DCED
RE5D4	Additional Funding Sources	Jill Smythe, Director of Special Projects, USDA – Rural Development
RE5D5	Pre-Paid Meters	Clarissa Quinlan, Precision Power

THURSDAY, September 19, 2002

Plenary Session: ***A Look to the Future*** **Miners Hall**

Introduction	Mike Harper, Deputy Director – Rural Energy, AIDEA
Where AVEC Has Been, Where AVEC is Going	Meera Kohler, President & CEO, AVEC
Sustainable Systems for Rural Alaska	Bill Allen, State Office Director, USDA Rural Development
Future Systems	James Kenworthy, Executive Director, ASTF
Pathways to Development	Norm Phillips, Resource Manager, Doyon Ltd.

10:00am – 10:30am Break

10:30am – 12:00pm **Technical Session 6**

6A: Distributed Generation and Related Topics **Miners Hall North**

Interest in distributed generation in the Lower 48 has significant potential impact on Alaska. In particular, small residential systems developed for grid connected applications may provide both electricity and heat for individual homes, while increasing overall system reliability. This session will address the current state of the art in this field.

Chair: John Boyes, Manager Energy Infrastructure and Distributed Energy resource, Sandia National Lab

RE6A1	Economics of Alternatives	Dennis Witmer, Acting Director AEDTL, UAF
RE6A2	Pure Water from Waste Heat	David Bubenheim, NASA Ames
RE6A3	Photovoltaic System in Venetie	Lance Whitwell, Native Village of Venetie and David Blecker, Earth Energy Systems
RE6A4	Distributed Generation (micro-turbines)	Brent Petrie, Manager, AVEC

6B: Data Acquisition and Control **Miners Hall South**

New remote data acquisition and control hardware is changing the way utilities understand and manage remote power plants. This session will cover hardware, software, and how this new information can lead to significant changes in the way remote village power is provided in Alaska.

Chair: Dennis Meiners, Development Specialist, AEA

RE6B1	High Speed Internet Access for McGrath	Ernie Baumgartner, General Manager, ML&P
RE6B2	Starband Rural Data Acquisition	Frank Worchester, President, Dish Alaska
RE6B3	High Speed Communications Systems for Rural Villages	Ron Johnson, Professor of Mechanical Engineering, UAF
RE6B4	Automated Metering and Data Collection	Eric Stroh, Western Regional Marketing Manager, Power Measurement Ltd.
RE6B5	Real Time Data Acquisition	Don Eller, Tanana Power

THURSDAY, September 19, 2002

Technical Session 6 *cont'd.*

6C: The Future of the Rural Infrastructure **Prospector Room**

This session will address the increasing number of construction projects planned for rural communities. The discussion will include a look forward to some of the projects planned for the next several years.

Chair: Chris Mello, Program Manager, AEA

RE6C1	Regional Transportation Plan Overview	Mike McKinnon, Transportation Planner, AK Dept. of Trans.
RE6C2	Rural Sanitation Plans	Derek Chambers, Environmental Engineer, Tanana Chiefs Conference, Inc
RE6C3	Rural Infrastructure	Don Antrobus, ANTHC
RE6C4	Business Plans for Rural Sustainability	Jolene John, Development Specialist, AEA
RE6C5	Five-year Construction Plan for Rural Schools (non digital presentation)	Eddy Jeans, Finance Manager, Education & Early Development