

Alaska

Solar Energy Workshop

April 30th, 2015

Anchorage, Alaska

Organized by



ACEP
Alaska Center for Energy and Power

Event Agenda

Time and Date: 8:30am – 5:00pm, April 30th, 2015

Location: NANA Development Corporation

909 West 9th Avenue, Anchorage, AK 99501

Goals: The Alaska Solar Energy Workshop is a venue to facilitate an exchange of information and ideas regarding appropriate solar PV development in Alaska with emphasis on project performance, economics, best practices, and alternatives.

8:30 am: **Welcome and Introductions** - Gwen Holdmann (ACEP), Sonny Adams (NANA), and Sean Skaling (AEA)

9:00 am: **PANEL DISCUSSION: SOLAR TECHNOLOGY NUTS AND BOLTS**

There are many technical aspects of solar project development, particularly in the unique environments of Alaska, that are critical to success. Come learn from experienced project developers how to avoid common pitfalls and optimize project outcomes by appropriate site choice, design, equipment specification, and construction methods.

(Moderator – Erin Whitney, ACEP)

Panelists:

- Greg Egan (Remote Power Inc.)
- Rob Bensin (Bering Straits Development Company)
- Daisy Huang (ACEP / College of Engineering and Mines ME Department)

10:15 am: **Break - Sponsored by Capstone Solutions, Inc.**

10:30 am: **PANEL DISCUSSION: CASE STUDIES FROM AROUND THE STATE**

The number of solar PV installations in Alaska is unknown, but is likely to be in the hundreds. The speakers in this session will describe a few recent projects, the challenges encountered, and lessons learned.

(Moderator – David Lockard, AEA)

Presenters:

- Solar PV on community buildings in NW Arctic Borough (Ingemar Mathiasson, Northwest Arctic Borough)
- Lessons from developing solar in rural AK (Jason McEvers, Capstone Solutions)
- Overview of projects installed in Interior communities and lessons learned (David Pelunius-Messier, TCC)

11:45 am: **PANEL DISCUSSION: PLANNING FOR SUCCESS**

Solar energy is somewhat unique in that systems are modular, and can be installed with minimal

equipment. Nonetheless, careful thought and planning is necessary to ensure successful implementation of grid connected solar PV systems. This panel will review some of those strategies, focusing on project design, planning, and permitting.

(Moderator – Givey Kochanowski, US DOE Office of Indian Energy Policy and Programs)

Presenters:

- Rooftop versus community scale solar (Brian Hirsch, NREL)
- Proper sizing a solar PV project (Marc Mueller-Stoffels, ACEP)

1:00 pm: Lunch (provided by NANA) and networking opportunity

1:30 pm: PANEL DISCUSSION: SOLAR ENERGY FROM THE UTILITY PERSPECTIVE

Utilities may have a different perspective on solar PV development than developers and even customers do. This session will describe the regulatory requirements related to interconnection and the limits on distributed generation penetration.

(Moderator – Clay Koplin, Cordova Electric Cooperative)

Panelists:

- Paul Carroll (US DOE/NRECA)
- Steve Gilbert (AVEC)
- Kord Christianson (TDX Power)

2:45 pm: Break - Sponsored by the Alaksa Energy Authority

3:00 pm: PANEL DISCUSSION: SOLAR PV PROJECT ECONOMICS AND FINANCING

Some solar PV economics are obvious (capital cost, fuel savings) and others may not be (maintenance, shading impacts on performance, inverter replacement, etc.) This session will dive into the details of solar PV economics in Alaska, as well as strategies and opportunities for financing projects through grants, loans, and public-private partnerships.

(Moderator – Antony Scott, ACEP)

Presenters:

- Financing energy projects in rural Alaska (Hugh Short, PT Capital, LLC)
- Native Corporations – Investing in your communities (Sonny Adams, NANA)
- Federal landscape for solar energy projects, including financing and tax incentives (Paul Schwabe, NREL)

4:15 pm: WRAP UP DISCUSSION: PEOPLE, PROCESS, TECHNOLOGY.

Our wrap-up session will focus on establishing the key components necessary for establishing a roadmap for solar PV development in Alaska, including identifying barriers to appropriate solar adoption in the Arctic and strategies to overcome them.

(Facilitated discussion led by Chris Rose, REAP)

5:00 pm: Adjourn

For more information contact us at mefrey@alaska.edu

Event Organized by:

Lunch and Venue
Provided by:



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Welcome and Introductions

Gwen Holdmann
Director, ACEP


Gwen Holdmann, Director, ACEP. Gwen is the Director of the Alaska Center for Energy and Power (ACEP), an applied energy research program based at the University of Alaska Fairbanks focusing on both fossil and renewable/alternative energy technologies. Her background is in mechanical engineering and physics. Gwen was recently selected as a recipient of the Arctic Fulbright Scholarship and will focus her research on energy policy to enable healthy communities in Alaska and across the arctic.

Sonny Adams
Director of Energy, NANA


Sonny Adams has worked for NANA Regional Corporation (NANA) as a Projects Manager since 2007 and is currently the Director of Energy. He is a graduate of Montana Tech with a degree in Metallurgical and Materials Engineering. Mr. Adams' knowledge and expertise include, and are not limited to, the technical oversight of the Red Dog Mine, gravel issues within the NANA region, and shareholder development. Prior to working for NANA, Mr. Adams worked as an operator and metallurgical engineer at the Red Dog Mine.

Sean Skaling
Program Development and Project Evaluation Director, Alaska Energy Authority


In this role, Mr. Skaling oversees AEA's energy efficiency programs, the Alaska Renewable Energy Fund, the Emerging Energy Technology Fund, and other alternative energy projects. Prior to this position, Mr. Skaling managed AEA's energy efficiency programs for three years, and previously served as executive director of Green Star for a decade. Mr. Skaling, who originally hails from Maine, received his bachelor's degree from Colby College, master's degree from the University of Colorado Boulder.

PANEL DISCUSSION: SOLAR TECHNOLOGY NUTS AND BOLTS


Moderated by:
Erin Whitney
Research Faculty, ACEP

Dr. Whitney came to ACEP from the National Renewable Energy Laboratory (NREL) in Golden, Colorado where she led the Dynamic Windows research group and the Dynamic Windows Durability Testing Program. While there she also managed technical assistance for a 2 MW Solar America Showcase project and provided energy analysis for solar thin film technologies. She has research experience in the fabrication and spectroscopy of photovoltaic devices as well as synthesis and characterization of carbon-based nanostructures and metal oxide nanoparticles for various renewable energy applications.

Panelists:
Greg Egan
Founder, Remote Power Inc.

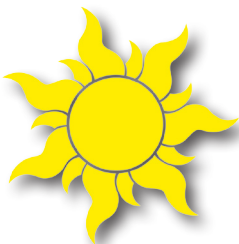

Greg Egan has designed and/or installed over 100 wind and solar microgrid power systems for residential, commercial and industrial applications. He is a licensed journeyman electrician, NABCEP certified PV installer and president of Remote Power Inc. in Fairbanks, Alaska.

Robert Bensin
Electrical Administrator, Energy Efficiency and Renewable Energy Division Manager, Bering Straits Development Company


Residing in Nome, Alaska Robert Bensin works for a general contracting subsidiary of Bering Straits Native Corporation. In addition to managing the electrical department, it is the broad knowledge of the challenges faced in rural Alaska communities that has driven his commitment to dedicate the energy efficiency and renewable energy division to help educate, develop and implement projects that achieve a lower cost of living, reduction of carbon foot print, and promote a healthy living environment. Robert has expertise performing residential, commercial and institutional energy audits, developing and implementing high yield energy efficiency measures, and renewable energy installations including solar PV, wind, solar thermal and off grid hybrid systems.

Daisy Huang
Assistant Professor of Energy, ACEP / College of Engineering and Mines ME Department


Living in a dry cabin in a city with one of the highest heating requirements and highest costs of energy in the world has made Daisy keenly aware of the need to use technology to increase energy efficiency and to develop local renewable energy sources. Daisy is happy to work on the forefront of renewable energy research in the challenging arctic environment. Daisy earned her PhD in mechanical engineering from UAF in 2013. Before that, she spent seven years designing mechanical components for the semiconductor and power control industries, in the Silicon Valley. She also has broad experience in materials selection and design-for-manufacture criteria. She completed her MS in mechanical engineering at Santa Clara University, and her BS in mechanical engineering at UC Berkeley.

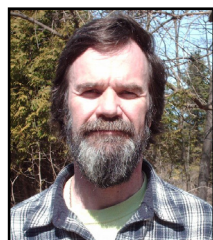




PANEL DISCUSSION: CASE STUDIES FROM AROUND THE STATE

**Moderated by:****David Lockard***Solar Program Manager, Alaska Energy Authority*

David has worked for the Alaska Energy Authority (AEA) since 1994 managing the design and construction of bulk fuel tank farms, diesel powerhouses, and other energy projects in Alaska's rural villages. He holds an Alaskan professional engineering license and is the Lead Engineer for AEA's Rural Energy Program.

Panelists:**Ingemar Mathiasson***Energy & Resource Coordinator, Northwest Arctic Borough*

Originally from Sweden, Ingemar received a Bachelor's Degree in Low Voltage Engineering & Telecommunications in 1981. He moved to Alaska in 1987 from Michigan. In the same year he started

a telecommunication and service company in Kotzebue called Electronic Services. Since 2009 he has worked as the Energy and Resource Coordinator for the Northwest Arctic Borough, managing the region's Strategic Energy Plan and multiple renewable energy projects that include wind/diesel, solar-PV, biomass, and energy efficiency.

Jason McEvers*President, CapStone Solutions*

Jason McEvers founded Capstone Solutions in 2003 with a focus on technical consulting for the wireless industry. Through the experience of managing large engineering teams for 20+ years, Jason identified the need for

off-grid and micro-grid solar power solutions at wireless communication sites in 2007. CapStone has designed and developed micro grid solar arrays throughout the Western United States and South America almost always in challenging locations. Since 2012 Jason has been dedicated to finding solutions to address the high cost of rural energy in Alaska.

David Pelunius-Messier*Rural Energy Coordinator, Tanana Chiefs Conference*

Since 2009, Dave has been working with rural Alaskan communities and small utilities on projects aimed at addressing and reducing the high cost of energy in Rural Alaska. Previous projects Dave has

been involved with include small wind, solar PV, solar thermal, biomass, hydrokinetics, energy efficiency and diesel power-plant upgrades. Dave has an undergraduate degree in Natural Resource Management from Cornell University, an MBA from UAF and is certified as a Project Management Professional (PMP) and a Certified Energy Manager (CEM).

PANEL DISCUSSION: PLANNING FOR SUCCESS

**Moderated by:****Givvy Kochanowski***Alaska Program Manager, US DOE Office of Indian Energy Policy and Programs*

Duty-stationed in Anchorage, Alaska, Givvy Kochanowski is responsible for the support and delivery of DOE technical assistance, capacity building, energy education, and outreach to all Alaskan tribal entities.

Presenters:**Brian Hirsch***Senior Project Leader for Alaska, National Renewable Energy Laboratory*

Dr. Brian Hirsch is the National Renewable Energy Laboratory's (NREL) Senior Project Leader for Alaska. He has been working on renewables in remote diesel microgrids throughout North and Central America for almost 20 years. His original orientation was from the hands-on perspective, having installed PV-diesel systems 200 miles north of the Arctic Circle almost 15 years ago. He has led or participated in solar energy installations across Alaska, including in the communities of Fort Yukon, Venetie, Arctic Village, Beaver, Chickaloon Village, Ugashik, Homer, and Kake. He has a PhD

in Land Resources, with a concentration in Energy Analysis and Policy from the University of Wisconsin-Madison.

Marc Mueller-Stoffels*Research Assistant Professor, ACEP*

Marc Mueller-Stoffels is the lead researcher for the Power Systems Integration (PSI) Program at the Alaska Center for Energy and Power (ACEP). Marc's research focuses on the integration of variable generation sources into isolated micro grids. Most recently he has lead the testing of an inverter-battery system to enable diesel-off mode in high contribution wind scenarios. Prior to joining ACEP, Marc has developed regional scale climate models with focus on Arctic sea

ice, and has chaired a small software company specializing in optimization algorithms. Marc holds graduate degrees in physics from the University of Alaska Fairbanks and Otago University, New Zealand.



PANEL DISCUSSION: SOLAR ENERGY FROM THE UTILITY PERSPECTIVE



Moderated by:

Clay Koplin

CEO, Cordova Electric Cooperative

Clay has a bachelor's degree in Electrical Engineering (BSEE) from UAF and a Master's in Business Administration (MBA) from Indiana University. He is a Registered Professional Engineer licensed in the State of Alaska. Clay was Staff Engineer at Kodiak Electric Cooperative for 7 years before joining Cordova Electric Cooperative for 9 years as their Manager of Operations and 8 years as CEO. Clay has worked with stakeholders to build an innovative Renewable Energy and Efficiency program that has propelled the community of Cordova, Alaska, beyond 70% renewable energy generation, 100% community LED street lighting, 100% underground power lines, and a culture of energy conservation and efficiency.

Panelists:

Paul Carroll

Project Manager, US DOE/National Rural Electric Cooperative Association



Paul Carroll is the Project Manager for the DOE/NRECA Solar Utility Network Deployment Acceleration (SUNDA) project. Paul brings more than twenty-five years of technology management and development experience to NRECA.

He has a diverse technology background with degrees in Physics, Engineering and Business Management.

Steve Gilbert

Manager of Energy Projects Development, Alaska Village Electric Cooperative



Steve Gilbert serves as manager of energy projects development for Alaska Village Electric Cooperative (AVEC) where he leads a team focused on lowering the cost of energy in rural Alaskan villages through

improved power plant efficiency, wind power and interties between villages. AVEC owns and operates 34 wind turbines in 11 micro-grids and one small solar project, all in rural Alaska. Steve has a Bachelor of Science and MBA and was the Alaska section of the IEEE electrical engineer of the year in 2000.

Kord Christianson

President, TDX Power



Kord Christianson is an accomplished, results driven Utility Energy Services professional with extensive experience conceiving, managing, developing and executing renewable and energy-efficient infrastructure projects in a wide

variety of challenging global environments. Currently he is the owner/operator of 6 regulated utilities in Alaska, including two high wind penetration wind-diesel systems. He has a Bachelor of Science degree from the University of Michigan in Industrial Operations Engineering.

PANEL DISCUSSION: SOLAR PV PROJECT ECONOMICS AND FINANCING



Moderated by:

Antony Scott

Senior Economist and Energy Analyst, ACEP

Antony Scott conducts research in energy analysis and policy at the Alaska Center for Energy and Power. Antony first came to Alaska in 2000 to serve as Chief Economist at the Regulatory Commission of Alaska, then managed the Commercial Section of the Division of Oil and Gas within the State Department of Natural Resources, and was charged with maximizing economic value associated with the State's \$2 billion in annual oil and gas royalty income. His focus at ACEP is to bring Alaska to the new frontier by increasing economic efficiency and decreasing energy expenditures at the household level.

Presenters

Hugh Short

Co-Founder and Chairman/CEO, Pt Capital, LLC



Prior to co-founding Pt Capital, Hugh Short was President and CEO of Alaska Growth Capital BIDCO, Inc., a subsidiary of Arctic Slope Regional Corporation. Alaska Governor Sean Parnell appointed Short to the Alaska Industrial Development Authority (AIDEA) and the Alaska Energy Authority in 2011. Shortly thereafter, he was appointed chairman of AIDEA and led the multi-billion state-owned investment bank. Short also served as the mayor of Bethel, Alaska from

2002 to 2004, and is a board member for Rural Energy Enterprises and United Utilities, Inc., a subsidiary of General Communication, Inc. Short received a bachelor's in political science from the University of Alaska Anchorage.

Sonny Adams, Director of Energy, NANA (SEE BIO ON FIRST PAGE)

Paul Schwabe

Senior Renewable Energy Financing and Policy Analyst, National Renewable Energy Laboratory



Mr. Schwabe is currently leading a solar economic assessment for remote Alaska villages and provides project development and finance assistance for Tribes throughout Alaska. Mr. Schwabe has also provided solar technical and business model assistance to tribal, municipal, and rural electric cooperatives throughout the United States. Paul holds a master's in applied economics and finance, and a bachelor's in economics from the University of California, Santa Cruz.

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Solar Energy Workshop

Presenter and Panelist Bios

WRAP UP DISCUSSION: PEOPLE, PROCESS, TECHNOLOGY.

Chris Rose

Executive Director, Renewable Energy Alaska Project



Chris Rose is the Executive Director of Renewable Energy Alaska Project (REAP), a non-profit coalition of over 80 diverse energy stakeholder organizations working to increase the production of renewable energy and promote energy efficiency across Alaska. REAP has been instrumental in helping to establish and fund clean energy policy and programs in Alaska, including the creation of the state's Renewable Energy Grant Fund in 2008, the Emerging Energy Technology Fund in 2010, ambitious state clean energy goals and several programs that encourage energy efficiency. Before founding REAP in 2004, Mr. Rose had a private law and mediation practice that included work in Northwest Arctic villages and the mediation of a variety of disputes around the state.



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