Microgrids Advisory Committee Workshop Materials

Tuesday–Wednesday, 23–24 February 2021

Zoom Virtual Meeting URL: https://us02web.zoom.us/j/83480127863

Zoom Virtual Meeting Password: 349983

This packet includes:

- Workshop goals
- Project overview
- Participant bios & fun facts
- Zoom information

The workshop agenda is available as a separate document.

Workshop Goals

- Provide participants with a review of project goals and the convergence research approach that the National Science Foundation's Navigating the New Arctic program encourages.

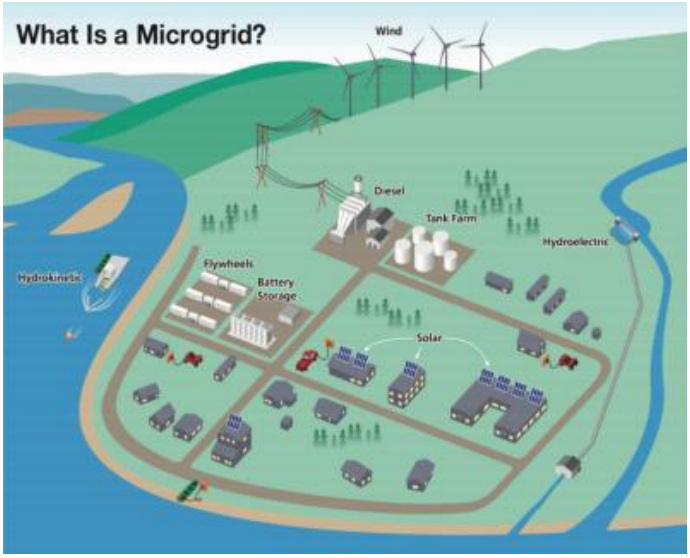
- Provide an opportunity for participants to get to know each other, and share their perspectives and experiences.

- Ensure participants understand why they've been asked to be involved and how their input will be used in the project.

- Share ideas on key project topics, such as:
    - What are the pressing energy issues for rural Alaska communities?
    - How can research contribute to solutions? What research is needed?
    - What are potential research partnerships and educational opportunities the project could pursue?

Planning for Research on Adaptable Microgrids in Arctic Communities
Project Overview

Project Goal: Arctic communities facing extreme climate stress, including possible relocation, might benefit from innovations in utility infrastructure design. The goal of this planning project is to build research relationships in order to study the possibilities of building modular, microgrid electric systems in rural Alaska. This project will cultivate new research relationships between engineering and social science disciplines, and among Arctic communities and organizations.



Schematic of a community microgrid (ACEP 2015). Microgrids include energy sources, the power lines that distribute electricity, and energy sinks.

Funding Agency: National Science Foundation, "Navigating the New Arctic" program

Planning Project Research Team:

Dr. Kristen Schell schelk@rpi.edu, Industrial and Systems Engineering, Rensselaer Polytechnic Institute

Dr. Marie Lowe mlowe@alaska.edu, Institute of Social and Economic Research, University of Alaska Anchorage

Dr. Steve Colt sgcolt@alaska.edu, Alaska Center for Energy and Power, University of Alaska Fairbanks

Project Timeline:

1. Formation of a Research Advisory Committee (Fall 2020)

2. Advisory Committee Workshop Meetings (February 2021 and October 2021)

3. Arctic Community Visits to Potential Partner Communities (Timing TBD)

4. Develop relationship with ANSEP (September 2020–September 2021)

5. Overall Project Goal/Outcome (February 2022):
   Write and submit a collaborative research proposal with interested partners to the National Science Foundation. The future research project will be conducted to: understand how at-risk communities use energy and for what; identify economic tradeoffs involved in the design and possible relocation of infrastructure; create engineering computer models for building modular, microgrid systems in Alaska; and present involved communities with design alternatives for their desired energy infrastructure.

Main Planning Grant Activities:

1. Formation of a research advisory committee composed of regional Alaska Native organization representatives, regional electric utility representatives, Alaska-wide renewable energy initiative representatives, and a representative from the Alaska Native Science and Engineering Program (ANSEP).

2. Two advisory committee workshop meetings:
- February 2021 meeting: seek advice where a future study could be conducted, how best to conduct it, and the most important issues to consider.
- October 2021 meeting: report back to committee on project findings.

3. Arctic community visits by the research team to build relationships and gather initial information:
- The research team would like to visit at least two Arctic communities that have been suggested by the advisory committee and confirmed as participants by community tribal and/or city councils.
- Goals for the community visits will include:
  - Understanding the physical setting of each community and the general pattern of energy use.
  - Developing research relationships with local experts.
  - Discussing the participatory design model with community members.
  - Drafting a plan for potential applied products of the future research.
  - If feasible, coordinating timing of visits with any community culture or science camps to engage youth on the topics of microgrids, renewable energy and climate change.

4. Develop relationships with Arctic community schools and ANSEP to incorporate K–12 education and continuing participatory science projects in future research.

Participant Bios & Fun Facts

Matt Calhoun - (mecalhoun@alaska.edu) Matt Calhoun is an Assistant Professor of Civil Engineering with the University of Alaska Anchorage where he also serves as serves as an Alaska Native Science & Engineering Program (ANSEP) researcher and faculty advisor for ANSEP's 2500+ pre-college and college students. His research focuses on cost-effective solutions for cold regions and sustainability.

Jocelyn Fenton - (jfenton@denali.gov) Jocelyn serves as the Transportation and Infrastructure Protection Program Manager at the Denali Commission, an independent federal agency providing critical utilities, infrastructure, and economic support for Alaska. In this role, she works to mitigate threats to infrastructure in rural Alaskan communities.

Gwen Holdman - (gwen.holdmann@alaska.edu) Gwen is the founder and Director of the Alaska Center for Energy and Power, an applied energy research program based at the University of Alaska Fairbanks which focuses on community- scale fossil and renewable/alternative energy technologies. Specific areas of emphasis include power systems integration for microgrids, hydrokinetic energy, low temperature geothermal, and diesel efficiency.

Rob Jordan - (rjordan@realaska.org) Rob is the Microgrid Coordinator for the Renewable Energy Alaska Project (REAP), a non-profit organization dedicated to increasing the development of renewable energy and energy efficiency in Alaska through collaboration, education training, and advocacy.

Meera Kohler - (mkohler@avec.org) Meera is the President and CEO of Alaska Village Electric Cooperative (AVEC), a non-profit electric utility owned by the residents of 58 communities throughout Alaska. AVEC serves more than 11,000 customers in remote Alaska and covers the largest area of any retail electric cooperative in the world.

Dustin Madden - (dmmadden1@anthc.org) Dustin is the Rural Energy Program Manager in the Alaska Native Tribal Health Consortium's Division of Environmental Health and Engineering. He manages a team of engineers and project managers that work in partnership with rural communities to develop and implement renewable energy and energy efficiency projects to reduce the cost of energy for rural water and sewer systems.

Ingemar Mathiasson - (imathiasson@nwabor.org) Ingemar is the Energy Manager for the Northwest Arctic Borough, the second largest borough in Alaska. In this role, he works to develop options for reducing energy costs while maintaining or improving current levels of service in the Northwest Arctic Region of Alaska.

Aimie Morgan - (amorgan@avec.org) Aimie serves as an Electrical Engineer for the Alaska Village Electric Cooperative (AVEC), a non-profit electric utility owned by the residents of 58 communities throughout Alaska. AVEC serves more than 11,000 customers in remote Alaska and covers the largest area of any retail electric cooperative in the world.

Jackie Qataliña Schaeffer - (jdschaeffer@anthc.org) Jackie serves as the Senior Project Manager for the Alaska Native Tribal Health Consortium's Division of Environmental Health and Engineering where she works to create strategic plans for rural communities and offers stakeholder facilitation and project support for a broad range of energy-related projects.

Herb Schroeder - (herb@alaska.edu) Herb Schroeder is the Vice Provost and founder of the Alaska Native Science & Engineering Program (ANSEP). ANSEP works with students starting in Kindergarten and every year through graduate school to the PhD. Thousands of students are involved from more than 100 communities across Alaska. The Urban Institute has found that ANSEP students on the average outperform all students in the nation at every educational level.

Anahma Shannon - (ashannon@kawerak.org) Anahma serves as the Environmental Program Director for Kawerak, Inc where she works with Native communities in the Bering Strait region to actively steward their land and resources through the development of environmental programs and partnerships targeted at emergecy preparedness, brownfields redevelopment, waste recycling, and regional energy planning.

Amanda Toerdal - (atoerdal@kawerak.org) Amanda is a former Energy Development Specialist for Kawerak, Inc. where she worked with Alaska Native communities to make actionable energy plans and develop sustainable energy projects in the Bering Strait region. In her new role at Kawerak as the Pilgrim Hot Springs General Manager, her energy focus has shifted to developing geothermal resources.

Thomas Wolf - (twolf@denali.gov) Tom serves as the Energy, Bulk Fuel, and Sanitation Program Manager at the Denali Commission, an independent federal agency providing critical utilities, infrastructure, and economic support for Alaska. In this role, he works to develop safe and reliable energy production and bulk fuel storage facilities throughout rural Alaska.

Michele Yatchmeneff - (myatchmeneff@alaska.edu) Michele is an Assistant Professor of Civil Engineering at the University of Alaska Anchorage where she also serves as an Alaska Native Science & Engineering Program (ANSEP) researcher and faculty advisor for ANSEP's 2500+ pre-college and college students. Her current research focused on the motivation and success of pre-college STEM students, belonging-ness, Alaska Native education, preparation, and retention.

Project Team:

Steve Colt - (sgcolt@alaska.edu) Steve is a Research Professor of energy economics and policy at the University of Alaska Fairbanks' Alaska Center for Energy and Power. His research looks at the roles of prices, incentives, and energy policy in supporting a shift toward sustainable and resilient microgrids and energy systems in Alaska.

Marie Lowe - (mlowe@alaska.edu) Dr. Marie Lowe is an applied anthropologist and a public policy faculty member at the University of Alaska Anchorage's Institute of Social and Economic Research (ISER). Dr. Lowe conducts a wide range of research concerning the cultural

dimensions of resource management, economic development, and Alaska/Arctic social policy issues. At UAA, Dr. Lowe has taught anthropology courses and is currently involved in co-designing a Master's of Public Policy program in UAA's College of Business and Public Policy with an emphasis on Alaska and Arctic policy issues.

Kristen Schell - (schelk@rpi.edu) Kristin is a Research Scientist at the Rensselaer Polytechnic Institute School of Engineering. Her research lies at the interface of engineering, operations research and economics, leveraging these domains to analyze the complex questions facing the transition to an electric power system dominated by renewable energy sources.

Workshop Planning & Facilitation Team:

Kuba Grzeda - (kuba@arcus.org) Kuba serves as a Project Coordinator for the Arctic Research Consortium of the U.S. (ARCUS). He has been a member of the ARCUS team supporting the Navigating the New Arctic (NNA) investigator community and provides key technical and facilitation support for the many virtual meetings and events ARCUS hosts or assists with each year.

Brit Myers - (brit@arcus.org) Brit serves as a Project Manager for the Arctic Research Consortium of the U.S. (ARCUS) and has been managing the ARCUS support activities for Navigating the New Arctic as well as other programming and events promoting interdisciplinary Arctic research collaboration.

Helen Wiggins - (helen@arcus.org) Helen is the Executive Director of the Arctic Research Consortium of the U.S. (ARCUS), which works to facilitate cross-boundary Arctic research activities. She has been leading the ARCUS team supporting the Navigating the New Arctic (NNA) investigator community, prior to the establishment of a permanent NNA Community Office by the National Science Foundation.

Fun Facts About Participants or Their Community - How Many People Can You Guess?

1. When I introduced the first heat-pumps to a household in Shungnak, the house owner exclaimed "Wow you are bringing air-conditioning to the Eskimos"!

2. For the month of December, we ran a heat lamp in our chicken coop that doubled our electric bill, from $130 to $260.

3. I've lived in four different states, three different countries, and have used electricity generated by eight different kinds of sources. Living in rural Alaska has given me a more intimate understanding of where my electricity is coming from, and made me realize how magnificent it is to have reliable power.

4. I have two teenagers in my home who like to lecture their parents about the need for all of us suburbanites to move into high density housing and the immorality of drilling in ANWR, yet

I often find their aluminum cans and plastic bottles in the garbage instead of in the recycling bin.

5. At the end of WWII, the shortage of electricity in Anchorage was so critical the city purchased the stern half of a wrecked ocean-going tanker, the Sackett's Harbor, in a desperate attempt to meet demand. The hulk was beached at the mouth of Ship Creek, and the boilers and generating equipment were used to deliver much-needed power. This makeshift solution was soon generating 42%, nearly half, of Anchorage's power requirement. Unfortunately, the cost was nearly one cent per kilowatt-hour more than the city collected in revenue.

6. I recently hiked the Appalachian Trail. To walk from Georgia to Maine I needed only about 1200 Megajoules of incremental chemical energy from food - less energy than we find in only 9 gallons of diesel fuel.

7. I live in the woods and catch all my own food.

8. Solar in the Arctic works fabulously! So fab that our region is installing a solar farm!

9. One of the ways I keep my personal energy consumption down is by skate skiing to work in the winter—one of the joys of living in Anchorage!

10. After high school, I spent a few summers as a "Segway Tour Guide" for EcoSeg of Alaska. Our electric Segways had knobbly cross country tires and we'd do tours of downtown Fairbanks and the surrounding area.

11. One silver lining to all the beetle-killed spruce on our property in southcentral Alaska has been that we have a lot of wood to use for our woodstove, instead of burning fuel oil in our Toyo stove!

12. We just built a new detached garage that's essentially a two-story house in our back yard and our electric and gas bill have yet to go up (due to efficient insulation, windows, LEDs, etc.)!

13. I used to live in a one-bedroom apartment with a $95/month electricity bill.

14. The tribal village where my family is from considers diesel prices cheap if it gets below $9/gallon.

15. Only one of [my organization's] communities is accessible by road— the other 57 must be reached by boat or airplane.

16. The energy use in my household has doubled since my spouse turned an old garage on our property into a hair salon.

Zoom Information

Consent to Be Recorded

The meeting organizers plan to record the workshop as a way to supplement note-taking and to facilitate the development of an anonymized transcript that will be used in ongoing research by the Arctic Microgrids Planning Project research team. The recordings will not be shared publicly. If you have any concerns about being recorded, please contact Brit Myers at brit@arcus.org.

Joining the Meeting

Join Zoom Meeting
https://us02web.zoom.us/j/83480127863?pwd=a1dEVTBuY25GTGlYMU9QTWVGdndEUT09

Meeting ID: 834 8012 7863
Passcode: 349983
One tap mobile
+12532158782,,83480127863# US (Tacoma)
+16699006833,,83480127863# US (San Jose)

Dial by your location
+1 253 215 8782 US (Tacoma), +1 669 900 6833 US (San Jose), +1 346 248 7799 US (Houston), +1 312 626 6799 US (Chicago), +1 646 558 8656 US (New York), +1 301 715 8592 US (Washington D.C)
877 369 0926 US Toll-free
Meeting ID: 834 8012 7863
Find your local number: https://us02web.zoom.us/u/kckJMo5l7E

Before the Meeting Begins

Before the meeting, we encourage you to take the following steps:

- Download the Zoom app in advance of the meeting.
    - The web browser client will download automatically when you start or join your first Zoom meeting, and is also available for manual download here.
    - Although you can participate in the Zoom meeting using a Smartphone, we encourage you to join the meeting using a laptop, as Smartphone connections may limit the options you have available to see and share information.
- Join a test meeting to test out your audio/video settings, internet stability, and to familiarize yourself with the Zoom user controls.
    - If you have a slow internet connection or are experiencing other network issues, you may want to join the meeting audio by phone. If you choose this option, make sure both your Zoom mic and laptop audio are muted (otherwise you may end up with audio feedback!).
- For better audio quality, consider using a headset/headphones.
- Look for a place to connect that has good lighting and where you will not be back-lit. This will make it easier for other participants to see your video image.
- If you are interested in learning more about Zoom, a visit to the Zoom help website may also be helpful!

During the Meeting

During the meeting, the following details and "how-to" instructions may be useful:

- When you enter the meeting, your video will be switched off and your audio will be muted by the Host.
- You may turn on your video or mic at any time. However, we do ask you to keep your microphone muted when you are not speaking to help prevent disruptions and background noise. If you are joining the meeting audio by phone you can unmute and mute yourself by pressing *6.
- Your Zoom controls (video, mic, chat, etc) can be found by hovering your mouse over the bottom of your Zoom window.
- In the upper right-hand corner of your Zoom window, there are also tools that will allow you to toggle your screen between the Speaker View (which focuses the video on the person speaking) and Gallery View (so you can see multiple people at the same time).
- During the meeting, we invite you to chat with the hosts and other participants by using the "Chat" feature found in your control bar.
    - You will have the option to chat with "Everyone" who is participating in the meeting or you can chat privately with the Host or other meeting participants by selecting their name from the drop-down menu accessed through the chat panel.
- If you would like to alert the Host to the fact that you have a question or comment, you will also have the option to "raise your hand". To raise your hand, click the "Participants" icon on your control panel. On the bottom right side of the Participants screen, click the "Raise Hand" button. To lower your hand, click the same button (now labeled "Lower Hand"). People calling into the meeting can also use the raise hand feature by dialing *9 on their phone.