



# Arctic Energy Office Introduction

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# The Arctic Context for DOE (& the Nation/World)

## Needs

- Rapidly evolving natural, economic, and political environments
- Multiple stakeholders – indigenous, national, commercial
- Compelling technology maturation / transition opportunities
- Significant potential for circumpolar & trans-latitude collaboration



# Arctic Energy Office: A Critical Part of the DOE Mission

## Department of Energy Mission:

*Ensure America's security and prosperity by addressing energy, environmental and nuclear challenges through transformative science and technology solutions.*

## Department of Energy Goals:

- Combat the climate crisis
- Promote energy justice
- Facilitate energy transition
- Create Clean Energy union jobs

Secretary of Energy  
Deputy Energy Secretary

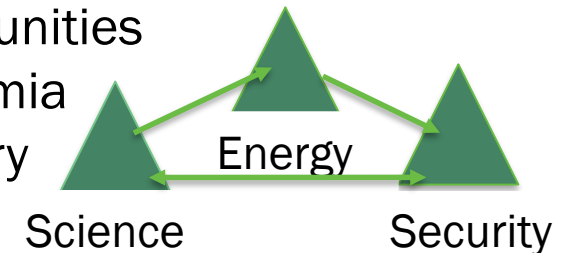
Under Secretary for Science and Innovation

Arctic Energy Office

## AEO Vision:

*To bring the Arctic to the Department of Energy (DOE), and DOE to the Arctic. We collaborate in innovative ways to meet the **energy, science and security** needs of the US and its Arctic allies.*

- Headquarters offices
- National laboratories
- Interagency
- Communities
- Academia
- Industry

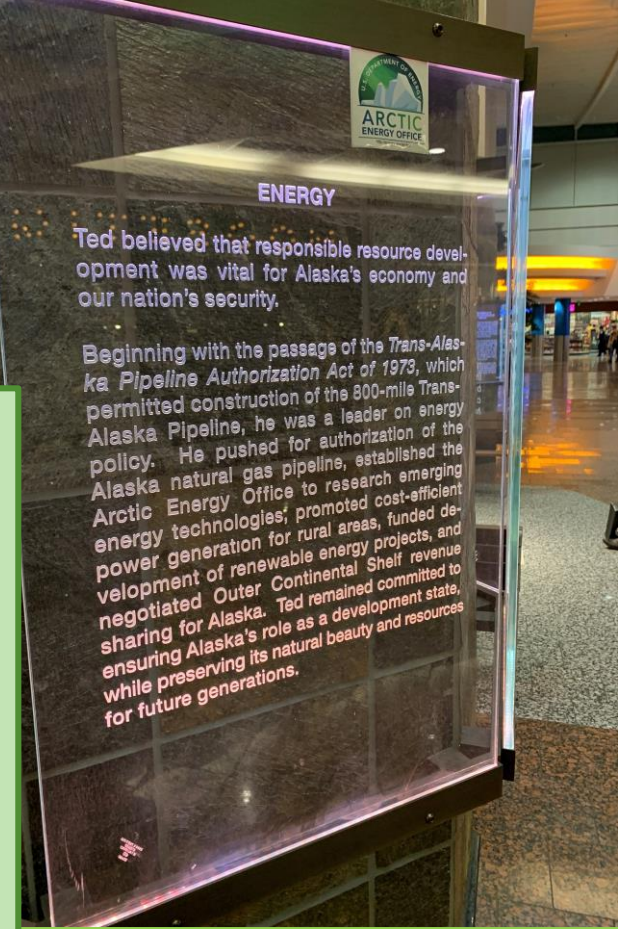


# Authority for Re-establishment of the AEO

- Energy Secretary Rick Perry's Nov. 2019 memo re-established AEO as principal advisor to the Under Secretary on domestic energy, science, and national security Arctic issues.
- The FY 21 Omnibus Bill *directed DOE to "continue the renewed focus on the Arctic region, and as a crosscutting activity, use the Arctic Energy Office as a centralized area to support the use of energy resources, but also innovative activities, including microgrids and integrated energy systems."*

## AEO's history

The Secretary was granted the authority to establish the Arctic Energy Office, by the 2001 National Defense Authorization Act. Previously, the bulk of the work of AEO was done by the Office of Fossil Energy through their National Energy Technology Laboratory.



The Ted Stevens plaque at Ted Stevens Int'l Airport in Anchorage mentions his work to establish AEO.

# Who We Are, What We Do & How We Can Help

## We are:

*A team with expertise in:*

- Engineering
- International affairs
- Science and research
- Military and government relations
- Tribal consultations
- Communications



## What we do and how we can help:

*Our main objectives are to:*

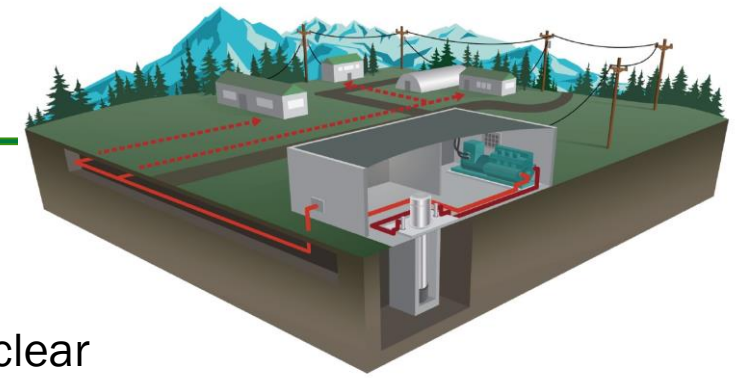
- Support U.S. Department of Energy policies, programs and events
- Advance Arctic energy transition in remote and rural communities
- Ensure tribal voices are heard
- Collaborate with Arctic stakeholders
- Connect stakeholders with government resources
- Ensure national security of the Arctic

*Information & Resources: <https://www.energy.gov/arctic/arctic-energy-resources>*

# AEO's Focus on Energy

AEO advances existing DOE research and programs:

- **Electricity:** Microgrids in rural Alaska
- **Efficiency:** capacity building, technical assistance to villages; partner with NREL's Alaska Campus (CCHRC)
- **Fossil:** carbon capture & transport, use & storage on North Slope
- **Geothermal:** Pilgrim Hot Springs, Makushin
- **Hydrokinetics:** research on tidal and marine energy at Tanana River, Igiugig, Cook Inlet
- **Nuclear:** Nuclear Energy Working Group discussions on small nuclear reactors at Eielson AFB
- **Solar:** installations at Shungnak, Kotzebue, Deering, Noatak (upcoming), & agrivoltaics research
- **Transportation:** EPIC funding award to Launch Alaska advancing electric vehicle transportation in Alaska.
- **Wind, batteries:** ETIPP awards to Alaskan villages to explore energy solutions
- **Hydrogen:** Hydrogen Energy Working Group, Alaska roadmap



Small nuclear reactor, above; Solar panels at the Village of Deering, AK, middle; and hydrokinetic testing in Tanana River, below.



# AEO's Focus on Science

AEO supports DOE projects at national labs:

- **Atmospheric Radiation Measurement (ARM)** at Utqiagvik with instruments, uncrewed aircraft; AEO is working with Sandia National Lab to maintain DOE airspace at Oliktok Point
- **Energy Exascale Earth System Modeling (E3SM)** experiments on Arctic tundra, mid-latitude, tropical forests, oceans
- **Next-Generation Ecosystem Experiments (NGEE Arctic)** to improve predictions of carbon Arctic-rich processes and feedbacks to climate
- **Arctic Innovators Program** at the University of Alaska Fairbanks, multiple National Labs

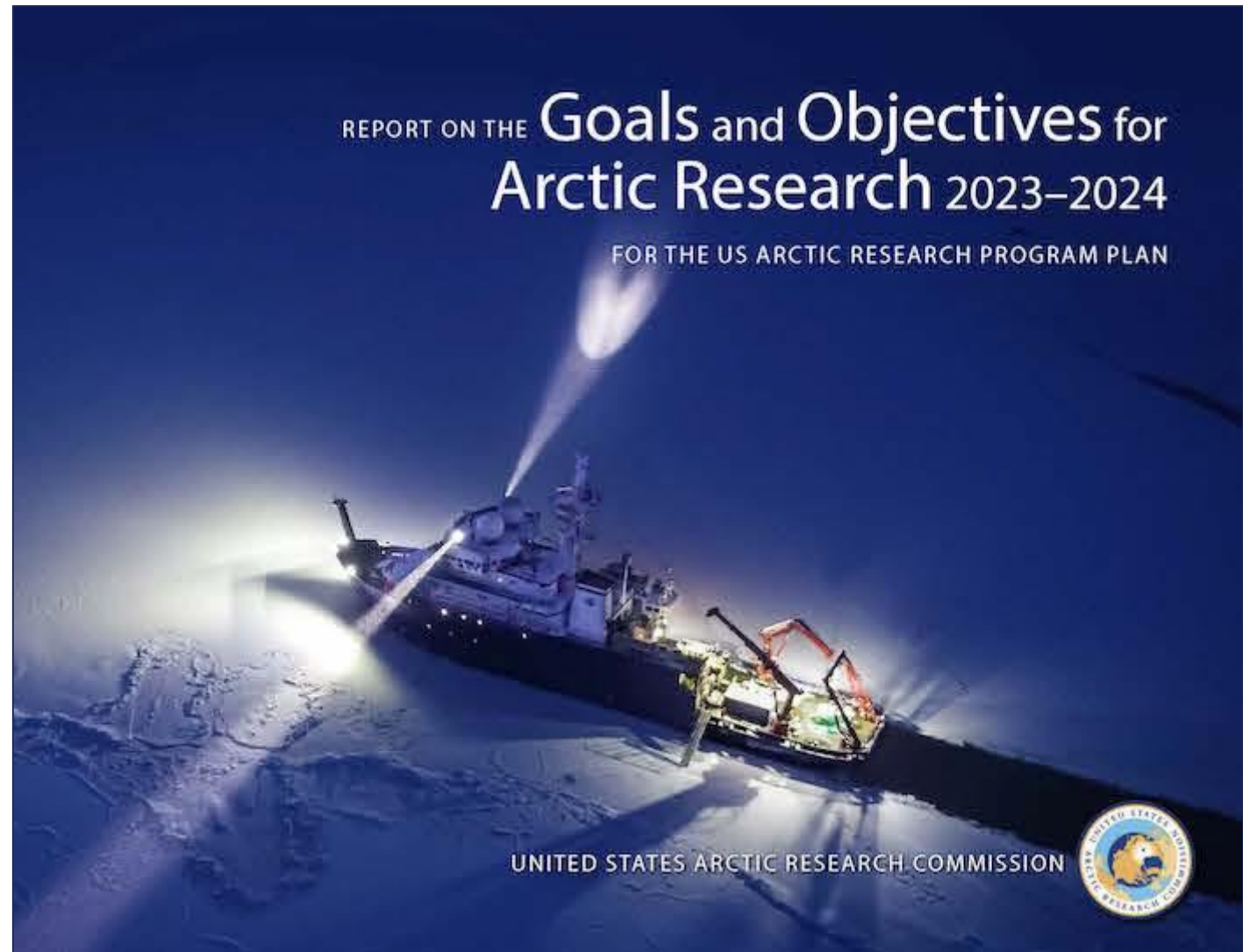


Atmospheric modeling at Utqiagvik, above; NGEE Arctic research, left and Arctic Innovators, right.



# Energy Themes: USARC Report on Arctic Research (Feb. 2023)

- **Infrastructure**: “Research methods to modify infrastructure to adapt to changing Arctic environmental conditions...”
- **Economics**: “Advance an understanding of the global economy's impact on the Arctic region, including a worldwide energy transition, Arctic marine operations and shipping, and the creation of an ocean technology testbed to advance mariculture and evolving marine ecosystems...”
- **Cooperation**: International, consistent with Indigenous values



<https://www.arcus.org/witness-the-arctic/2023/2/highlight/3>



# AEO's Focus on Security

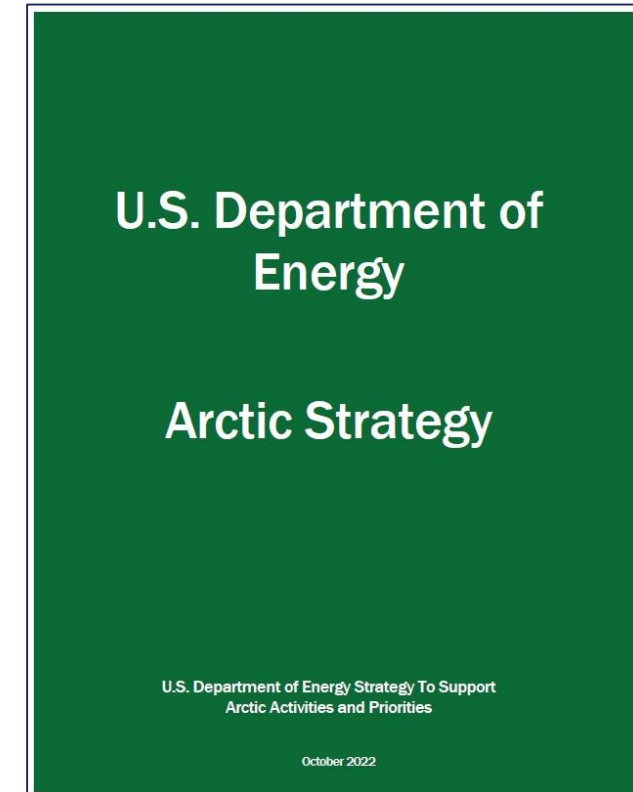
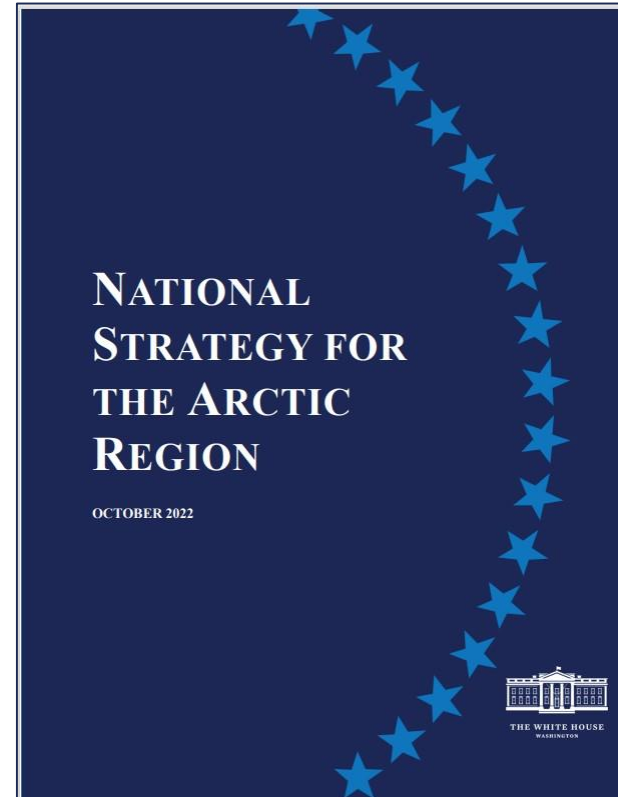
- AEO helps ensure national energy security by:
  - Promoting STEM initiatives in the Pan Arctic (ARENA)
  - Participating in the Arctic Council / Arctic Circle Assembly
- Collaborated with U.S. State Department's Arctic Coordinator
- AEO provided input to the Interagency Arctic Research Policy Committee's 2022-2026 Arctic Research Plan and the National Climate Strategy from the National Security Council.
- AEO represents DOE at the White House Arctic Executive Steering Committee.
- Mission Innovation proposal for AK-WA zero-emission shipping corridor
- Legacy nuclear site monitoring at Amchitka, Chariot and STEM program



Senior Advisors Mike McEleney & Matt Heavner at 2021 Arctic Circle Assembly in Iceland

# National Strategy for the Arctic Region (2022)

- The new National Strategy for the Arctic Region recognizes the increasing economic and national security importance of the Arctic.
- AE staff participated in the drafting of the strategy and its recommendations
- New DOE Arctic Strategy builds on the NSAR and provides specific goals and foci for departmental Arctic activity.



# National Strategy for the Arctic Region

## *Pillar 3: Sustainable Economic Development (\*)*

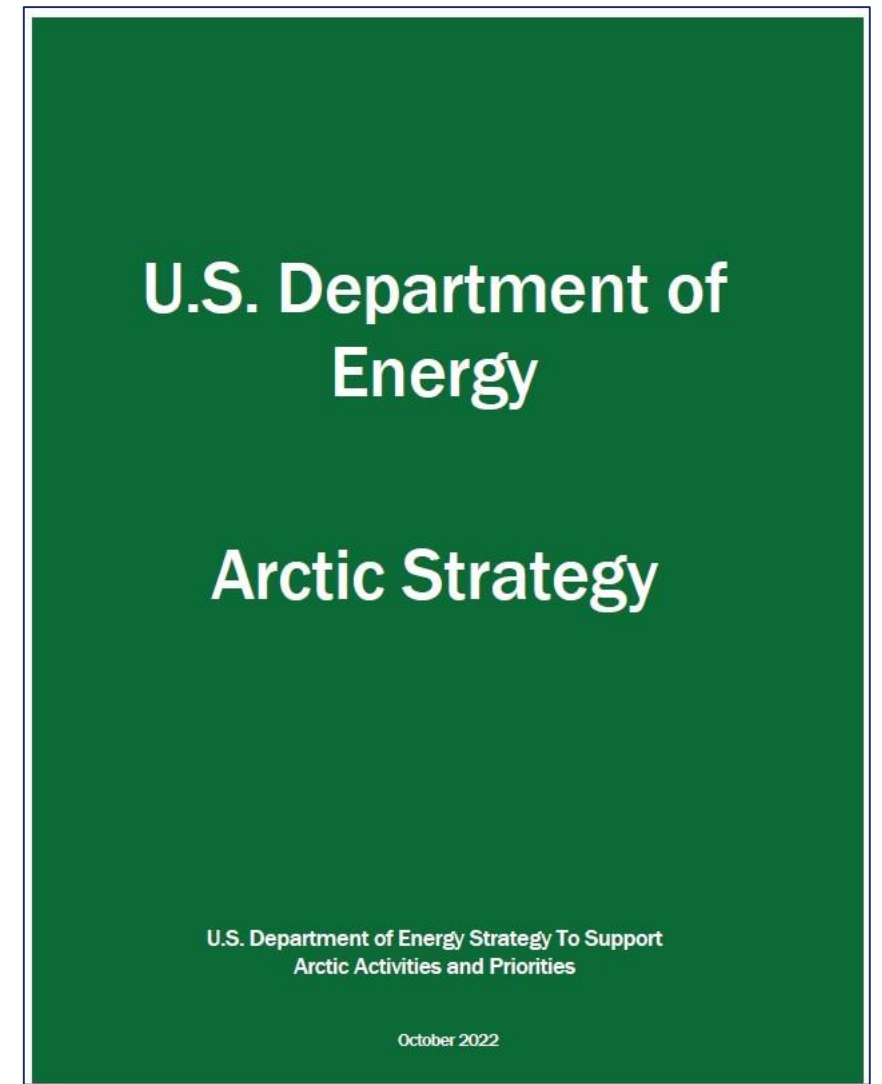
- Supports development of a deep draft harbor in Nome, as well as smaller ports, airfields, and other infrastructure in consultation with the State of Alaska and Alaska Native communities;
- Commits to help improve access to affordable energy by developing renewable energy generation, storage, transmission, and distributions;
- Commits to expanding support by U.S. government agencies for sustainable development of renewable energy, critical minerals production, tourism, and knowledge economy sectors in Alaska with the aim of creating sustainable growth and well-paying jobs in Alaska

*(\*) Pillar 1: Security, Pillar 2: Climate Change and Environmental Protection, Pillar 4: International Cooperation and Governance*

# U.S. Department of Energy – Arctic Strategy (2022)

DOE will lead and partner to:

- Advance the decarbonization, resilience, and equity of the Arctic energy sector;
  - Demonstrations, deployments, infrastructure, technical assistance, loan programs
- Advance the scientific understanding of Arctic challenges;
  - Computer modeling, engagement with a variety of stakeholders, relevance to the Arctic
- Ensure Arctic security.
  - Technical capabilities and solutions with focus on a changing climate, cooperation with national labs



# DOE/AEO Focus on Alaska

- State Energy Security Task Force (ex-officio member)
- Energy Working Groups and Roadmapping
  - Lead for Alaska Hydrogen Working Group, of Nuclear Energy Working Group
- Funding Awards
  - \$221,441 for State Energy Program (2015-2018)
  - \$1,220,420 for State Energy Program Formula Award (2018-2022)
- Grants via Weatherization Assistance Program (2015-2022)
  - 1,299 homes weatherized, 289 jobs created or retained, 14,489 people impacted by energy efficiency improvements
- Grants to Univ. of AK for Emerging Energy Opportunities in Alaska
- Partner with State's Office of Energy Innovation



# DOE-internal / Interagency / International Coordination

## International:

- Arctic Circle Assembly
- Arctic Science Ministerial prelude to Arctic Circle Japan Forum
- Dept of State in Canada's Nunavut
- Mission Innovation - Denmark
- National Lab Director Council / European Intergovernmental Research
- National Security Council Canada Desk
- Small & Less Populous Island Economies Interagency Committee
- S-Greenland Joint Committee
- Funding the first Arctic Embassy Science Fellow in DOE history to Iceland
- Coordinating DV outreach and fact-finding missions in Alaska and the Arctic

## Interagency:

- OSTP/Arctic Executive Steering Committee/IARPC
- Committee on the Marine Transportation System Arctic Integrated Action Team
- Arctic Policy Group (DOS)
- Denali Commission
- Department of State Arctic Policy Group
- DOD/Eielson AFB, Intelligence Community Environmental Security Working Group
- NASA/JPL (permafrost work)
- Port of Nome, Port of Anchorage
- UA Fairbanks, Alaska Nuclear Working Group, Alaska Hydrogen Energy Working Group

# Arctic Lab Partnerships (ALPs)

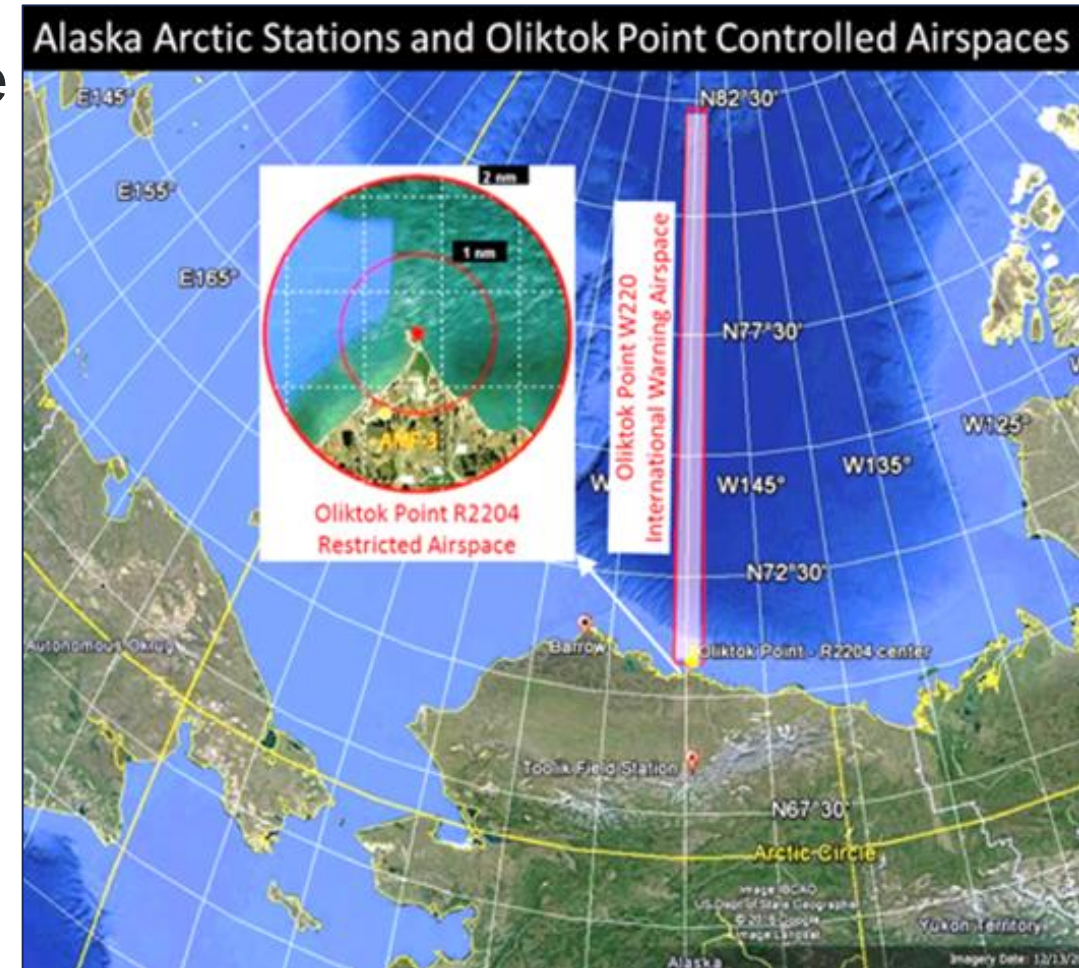
- AEO-led/coordinated via National Lab Chief Research Officers Council
- 12 national laboratories & University of Alaska
- 2020 workshop on Arctic research needs
- 2021 development of research white papers
- 2022 oversight of ArcticX InnovationX Lab webinar series and in-person conference



Argonne National Lab, Brookhaven National Lab, Idaho National Lab, Los Alamos National Lab, Lawrence Berkeley National Lab, Lawrence Livermore National Lab, National Energy Technology Lab, National Renewable Energy Lab, Oak Ridge National Lab, Pacific Northwest National Lab, Sandia National Lab, Savannah River National Lab

# Oliktok Site & Airspace Leverage

- Oliktok is the farthest north drivable location in the U.S. and has land/sea/air access
- DOE operates two airspaces on North Slope
- DOE/Office of Science/ARM operated at Oliktok 2013-2021
- AEO is finalizing transfer of responsibility with FAA for the airspaces
- Ongoing coordination with stakeholders
- Sandia National Lab is investing





# Future Priorities

- Facilitate partnerships, demonstrations, and deployments;
- Organize and disseminate information on DOE funding opportunities;
- Build community workforce and capacity;
- Communicate value of Arctic energy projects to national priorities.



# Thank You!

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