

Small Scale Nuclear Power *an option for Alaska?*

Gwen Holdmann,

Alaska Center for Energy and Power, University of Alaska Fairbanks



Presentation Agenda

PART 1: Context/intro

PART 2: Alaska Perceptions

PART 3: Alaska “Strategy” around nuclear energy



Reports

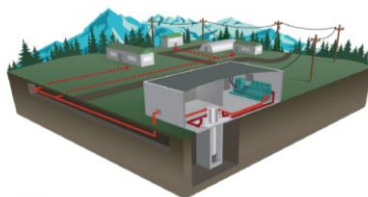
Small Scale Modular Nuclear Power: an option for Alaska?

2011

Prepared by the University of Alaska, Alaska Center for Energy and Power and the Institute for Social and Economic Research with funding through the Alaska Energy Authority

Small Scale Nuclear Power: an option for Alaska?

Update October 20, 2020



Prepared by the
Alaska Center for Energy and Power
University of Alaska Fairbanks
acep.uaf.edu



Outreach



U.S. DEPARTMENT OF ENERGY Environmental Justice and Equity Framework for Siting Nuclear Energy in America's Arctic

Nuclear Energy

OVERVIEW

Purpose: Create a community-centric framework and decision matrix for considering small nuclear reactors as an energy option for rural Alaska communities and similar, historically underserved populations in the United States.

Objectives:
Gather community perspectives: Establish new community engagement strategies that address historical misperceptions related to environmental contaminants in the Arctic associated with historic testing of radioactive materials; Community empowerment through citizen science Build student- and community-led environmental monitoring and data analytical capabilities that will empower local citizens;

Exploring pathways to community resilient energy futures: Develop a road map for understanding the opportunity space for micro-nuclear reactors (MNRs) in rural Alaska communities and similar remote areas, as part of a broader landscape of other resilient, cost effective and low-carbon energy options.

IMPACT

Logical Path:
Connecting and scaling the project research and community partners as part of building an Alaska Innovation Network, with specific community partners including the hub communities of Kotzebue and Nome.



Outcomes:

- Creation of a model for addressing the local community impacts of environmental contamination;
- Capacity building within rural and tribal communities
- A toolkit for communities to use for energy planning;
- Developed Teaching Through Technology curriculum which focuses on environmental monitoring and deployed throughout the NW Arctic Borough.

DETAILS

Principal Investigator: Gwen Holdmann
Institution: University of Alaska Fairbanks (UAF)
Collaborators: Diane Hirschberg (UAA); Haruko Wainwright (MIT); Ali Hanks (UC-Berkeley); Adam Low (UAF); Bruce McDowell (PNNL); Matt Bergan (KEA); Inesmar Mathiassen (NWAB); Chad Nordlum (NVK)
Duration: 3 years

johnson6@alaska.edu

RESULTS

Results:
Early project planning and collaboration underway between project partners.

Accomplishments:
Curriculum drafting for Task 2: Community empowerment through citizen science. Site identification for T3 hub underway. Focal geographies have been identified.

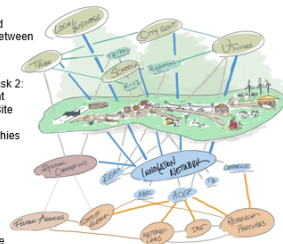
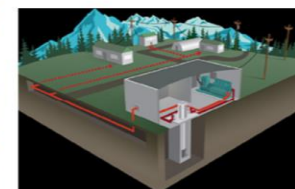


Image: example of our community innovation hub network for Kotzebue

Research

Nuclear Energy Working Group



With rapidly evolving technology, shifts in energy policy and the regulatory framework, and more favorable economics we're aiming to understand how small-scale nuclear power could fit into the energy landscape for Alaska, and whether the time is right.

The Alaska Nuclear Energy Working Group is an informal group of stakeholders interested in following developments related to small nuclear energy technologies, and in providing input related to any proposed future deployment in the state. ACEP plans to host regular meetings of the working group, which will include presentations from industry and other stakeholder groups. The working group will also be called upon to provide input on future studies, as well as the development of a state roadmap.

Interested in learning more? [Register to join](#) the Alaska Nuclear Working Group.

[Alaska Nuclear Energy Working Group Charter](#)

Project Details

Lead Researcher(s)

- Gwen Holdmann
- Richelle Johnson (rjohnson6@alaska.edu)

Reports

Connecting



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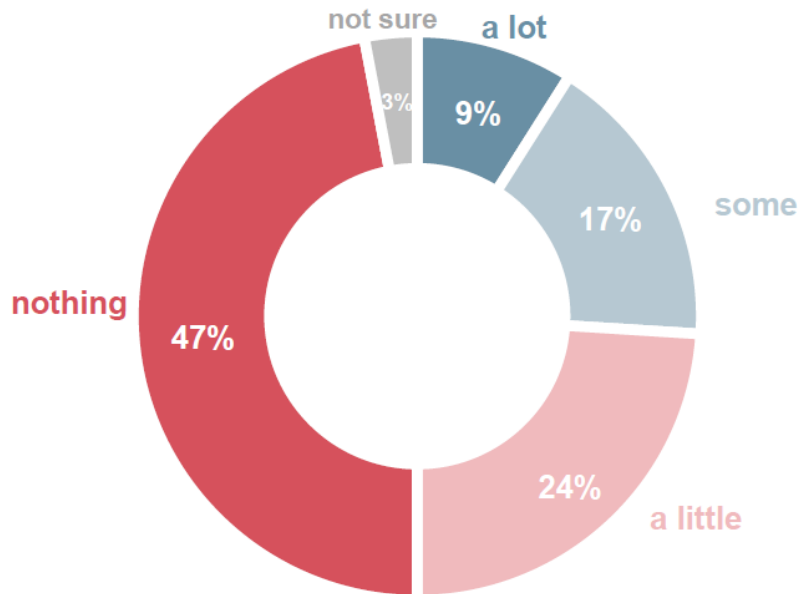
S360 Poll (Perception on Nuclear)

- Multi-modal survey 700 registered voters, oversample Fairbanks (172)
- Weighted to accurately represent Alaska's electorate
- Completed by phone May 23-June 4th
- Margin of error 4% (7.5% for Fairbanks)



When it comes to microreactors, there is a large information gap across subgroups.

Amount heard about nuclear microreactors*



	total heard a lot/some
Anchorage	29
Fairbanks	32
Kenai	21
Matsu	23
Southeast	16
Rural*	23
Age 18-49	27
Age 50+	24
Democrat	28
Independent	28
Republican	24
Live comfortably	33
Struggling to get by	21

*Small sample size

*How much, if anything, have you heard about a new type of nuclear technology called advanced microreactors?

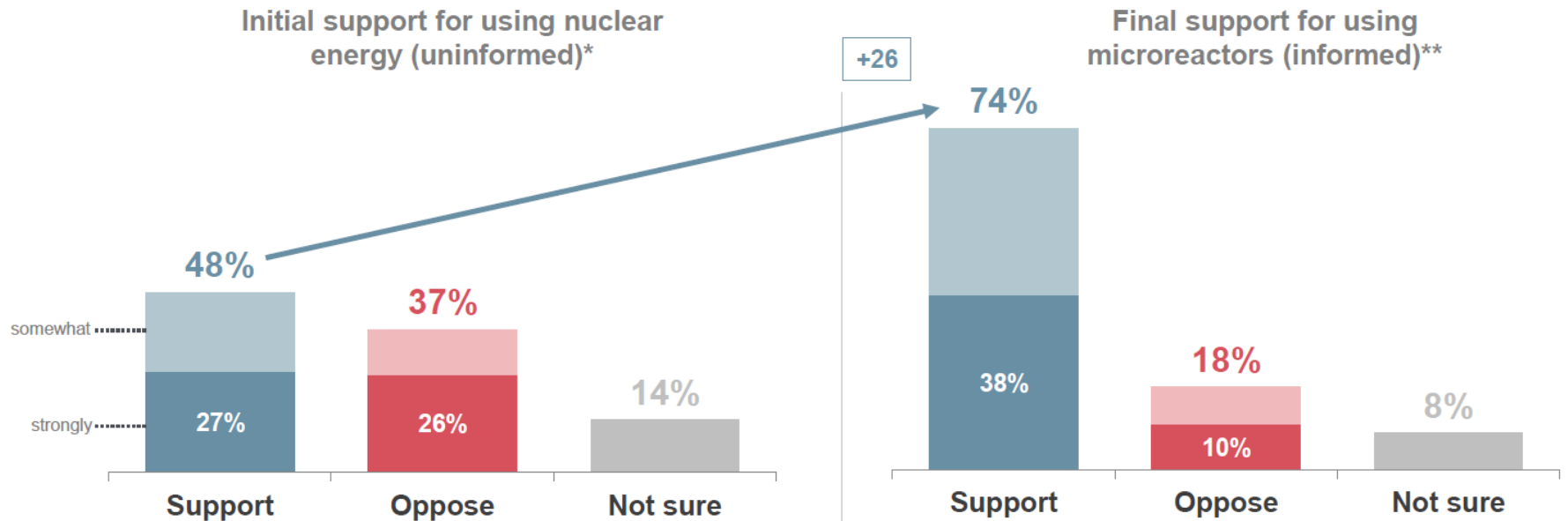
ES&P



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With little to go on, support for nuclear is tepid ... after more information is provided, support grows considerably

Change in support for using nuclear energy and microreactors in Alaska



*Based on what you know right now, do you support or oppose the idea of using nuclear energy in Alaska?

**A nuclear microreactor is a small nuclear reactor that is much smaller than conventional nuclear technology. Microreactors are essentially a small nuclear-powered battery. They vary in size based on the manufacturer, but in general would be small enough to fit inside a shipping container and produce around 10 megawatts, which could power around 7,000 homes and also provide heat. Because of their small size, microreactors use much less nuclear fuel and cannot melt down. They also do not require water for cooling. After learning more, do you support or oppose the idea of Alaska exploring the use of microreactors to supply energy to Alaskans?

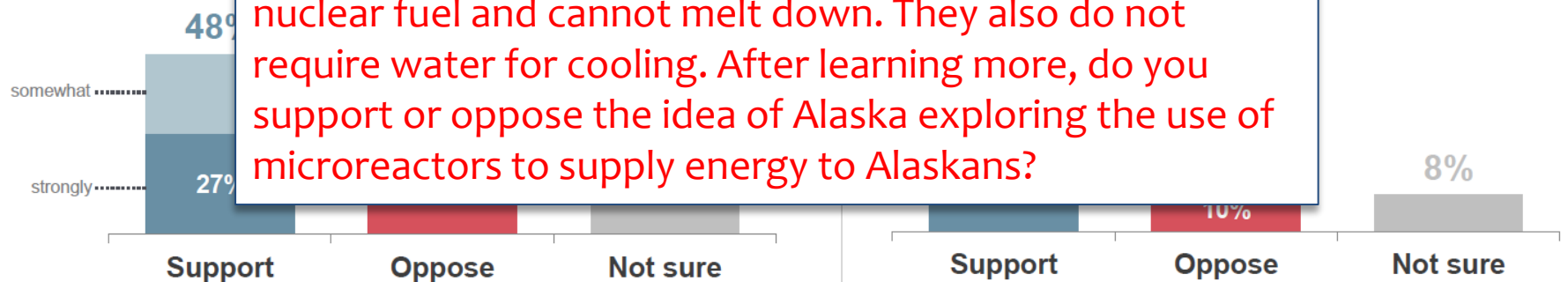
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E360



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Information changes perceptions

Change in support for using nuclear energy and microreactors in Alaska

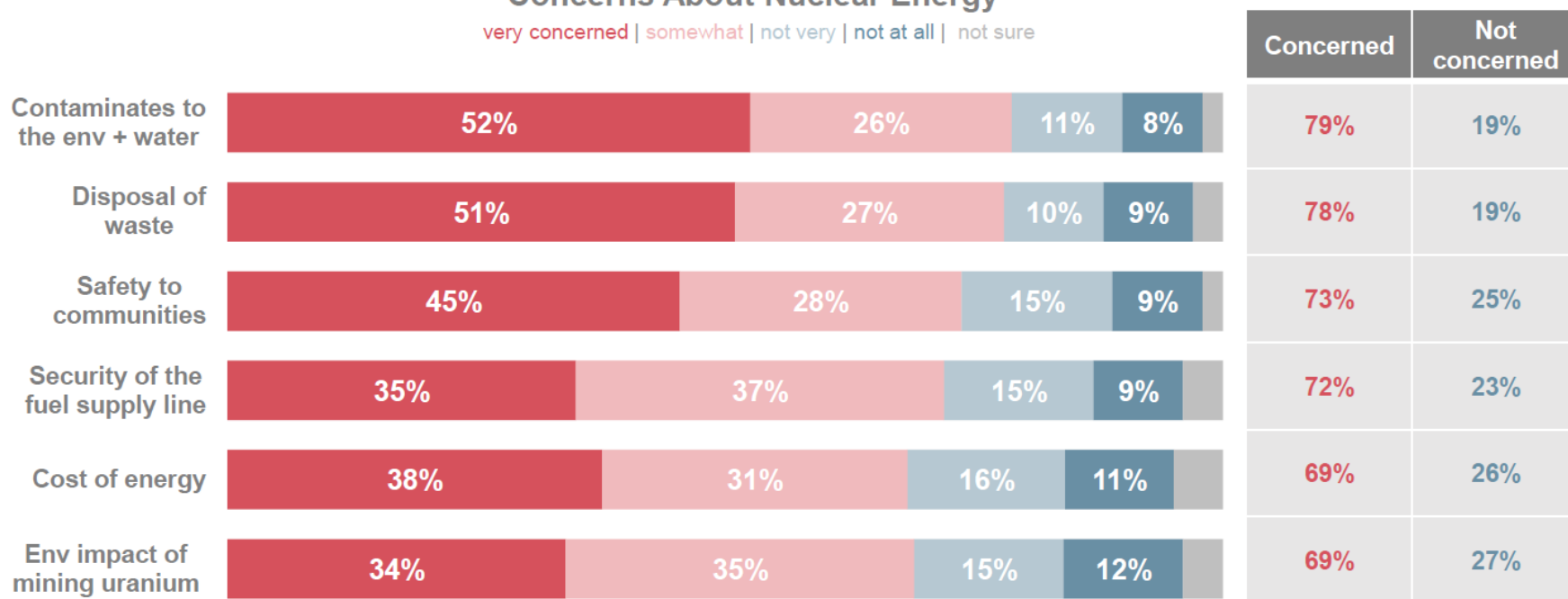
Support	Initial	Final	Δ
Total	48	74	+26
Anchorage	50	76	+26
Fairbanks	59	76	+17
Kenai	54	75	+21
Matsu	49	77	+28
Southeast	36	62	+26
Rural*	29	61	+32
Age 18-49	53	78	+25
Age 50+	42	68	+26
Democrat	42	76	+34
Independent	51	80	+29
Republican	56	72	+16

Support	Initial	Final	Δ
Total	48	74	+26
White	53	77	+24
POC	39	68	+29
Live comfortably	57	79	+22
Struggling to get by	43	72	+29
Affordable energy bills	52	74	+22
Unaffordable energy bills	41	72	+31
Heard of microreactors	71	80	+9
Haven't heard	41	72	+31

Voter concerns center on environmental contaminants and waste disposal

Concerns About Nuclear Energy*

very concerned | somewhat | not very | not at all | not sure



*How concerned are you about the following things when it comes to nuclear energy?

ES&CO



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Messaging

Messaging on microreactors as a safe, reliable piece of Alaska's approach to clean energy and addressing climate change stands up well to criticisms of the technology.

Alaska should explore developing nuclear microreactors as a diversified part of the state's energy supply mix. Nuclear energy is a clean energy option that will reduce greenhouse gas emissions and mitigate climate change. Technological advancements have made it possible to use safe microreactors that can provide a consistent and steady supply of cleaner, lower-cost energy to Alaskans.

57%

39%

Much more

18%

Nuclear power plants are an unproven technology that poses safety risks to the people and environment around them. Additionally, nuclear power plants are expensive to build and operate. Nuclear energy is not an efficient use of the state's resources, which are better spent on the other issues facing Alaska right now.

30%

15%

15%

Much more

*Please indicate which statement comes closer to your own view, even if neither is exactly right.

ES&P



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Perceptions are largely non-partisan

Top statement by key subgroup

	Alaska should explore developing microreactors...	Nuclear power plants are an unproven technology	Net "Should explore"
Total	57	30	+27
Heard of microreactors	73	18	+55
Haven't heard	53	33	+20
Always supportive	87	10	+77
Move to support	47	37	+10
Always opposed	14	73	-59
Democrat	58	22	+36
Independent	61	31	+30
Republican	56	36	+20



Alaska Strategy: *factors to consider*

- SB 194 – local control of siting authority for small reactors (<50 MW)
- Alaska is a near-ideal early adopter market (high cost of energy, heat + power)
- Interest from vendors
- Risk associated with being an early adopter (economic, technological, public perception, etc)
- Opportunity for state/federal partnership
- Passive or active decision making



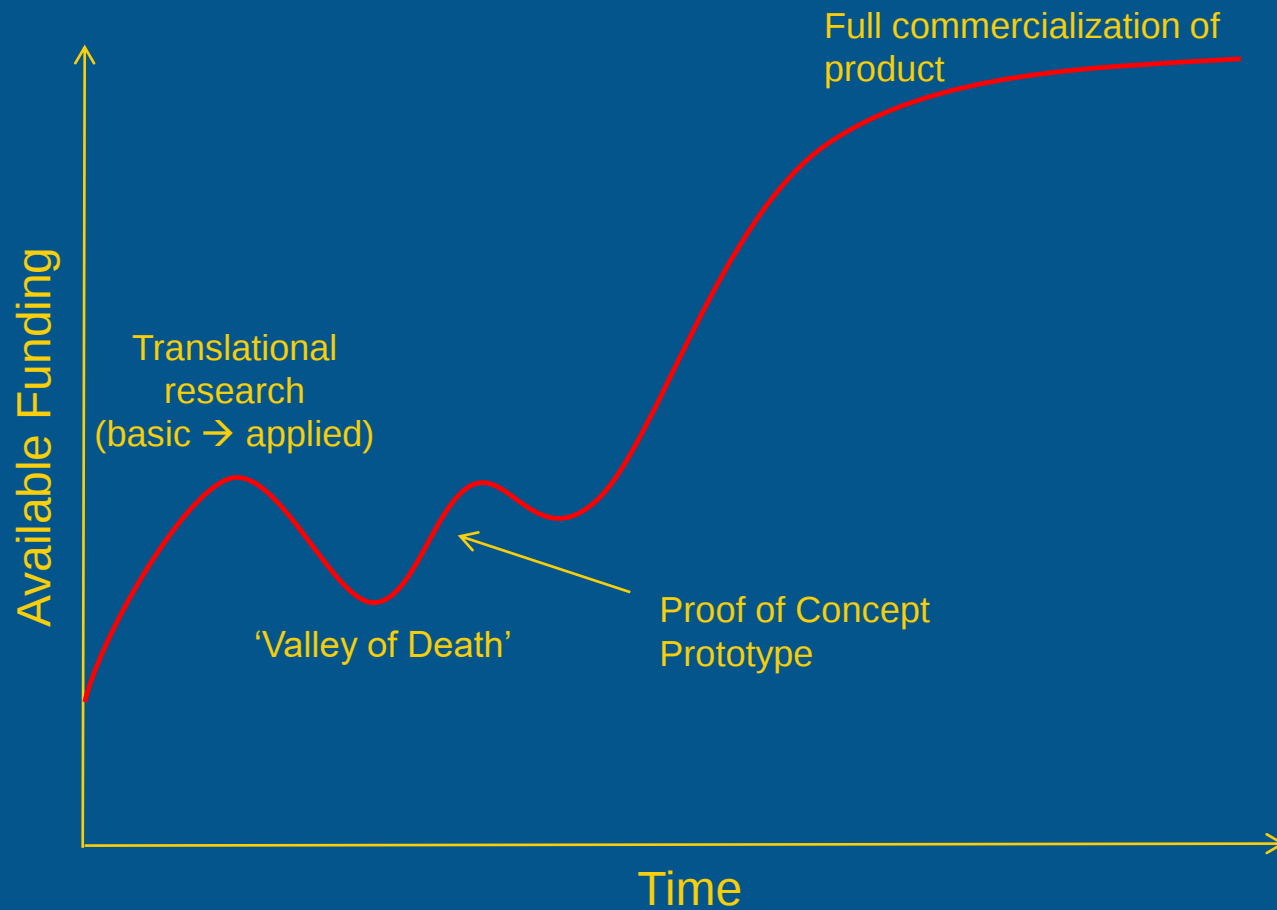
Weighing Risk versus Reward for Pilot Projects



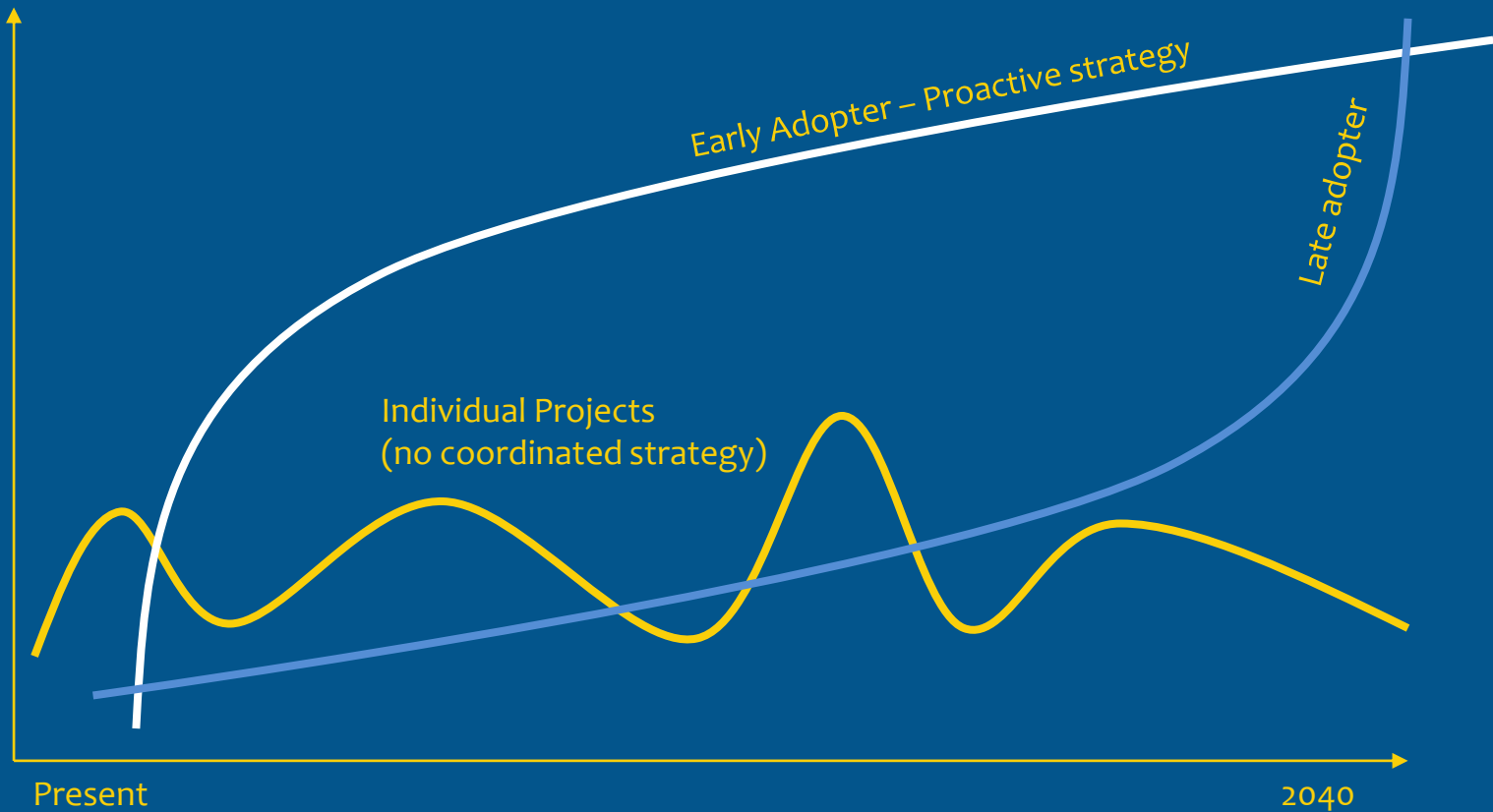
GVEA BESS (above);
Healy Clean Coal Project (right)



Valley of Death Bridge to Financeability



Alaska Pathways



Issues/considerations

- Public is not well informed
- Utilities (most) are taking a passive approach
- Traditional approaches to procurement and project development may not be optimal for early projects (RFS versus RFP)
- Announcement TODAY! Re: Eielson AFB reactor
- Lack of coordination – opportunity for Task Force



Why I am interested in small reactors:

- *Baseload heat and power*
- *Compliment to variable renewables*
- *Carbon free*
- *Safer, Reduced risk of environmental contamination*
- *Competitive Pricing?*
- *Better long-term certainty of energy costs*
- *Possible complement to existing AK resource mix*



Thank you!

Gwen Holdmann
Alaska Center for Energy and Power
University of Alaska Fairbanks
Gwen.Holdmann@alaska.edu

