

**ALASKA STATE LEGISLATURE
HOUSE SPECIAL COMMITTEE ON ENERGY**

April 4, 2024
10:15 a.m.

MEMBERS PRESENT

Representative George Rauscher, Chair
Representative Tom McKay
Representative Thomas Baker
Representative Stanley Wright
Representative Calvin Schrage

MEMBERS ABSENT

Representative Mike Prax
Representative Jennie Armstrong

COMMITTEE CALENDAR

PRESENTATION(S): NATIONAL RENEWABLE ENERGY LAB: ACHIEVING 80% RENEWABLE PORTFOLIO STANDARD IN ALASKA'S RAILBELT WITH COST ANALYSIS

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

PAUL DENHOLM, Senior Research Fellow
National Renewable Energy Lab
Golden, Colorado

POSITION STATEMENT: Gave a PowerPoint presentation on developing renewables in Alaska.

ACTION NARRATIVE

[10:15:27 AM](#)

CHAIR RAUSCHER called the House Special Committee on Energy meeting to order at 10:15 a.m. Representatives Schrage, Wright, Baker, McKay, and Rauscher were present at the call to order.

**PRESENTATION(S): NATIONAL RENEWABLE ENERGY LAB: ACHIEVING 80%
RENEWABLE PORTFOLIO STANDARD IN ALASKA'S RAILBELT WITH COST
ANALYSIS**

[10:16:12 AM](#)

CHAIR RAUSCHER announced that the only order of business would be a presentation, titled "National Renewable Energy Lab: Achieving 80% Renewable Portfolio Standard in Alaska's Railbelt with Cost Analysis."

[10:17:01 AM](#)

PAUL DENHOLM, Senior Research Fellow, National Renewable Energy Lab (NREL), gave a PowerPoint presentation [hardcopy included in the committee packet] on developing renewables in Alaska. He began on slide 1, which gave background on what NREL is and what its focus is regarding energy standards and portfolios. He continued to slide 3 and 4, where he explained the scope of the study on Alaska's Railbelt electricity grid, as well as explained the cost and drawbacks of the looming gas shortage in the Cook Inlet region. He said that renewable energy is a more stable energy source in comparison to the natural gas currently being used in the Railbelt system. He said that developing a renewable energy project is locking in the cost of electricity for decades through a contractual agreement.

[10:21:59 AM](#)

REPRESENTATIVE SCHRAGE asked where the study of the Railbelt grid came from, what the impetus of the study was.

MR. DENHOLM answered that the study originated in the governor's office and was performed by NREL using the lab's own dollars. He said that the study couldn't originally do cost analysis, so the new study aims to answer the question: "Can renewables save money?"

[10:23:48 AM](#)

MR. DENHOLM resumed his presentation on slide 6, which posed the question of renewable energy offsetting current fuel use and expense. He said about 7 to 8 cents of cost of energy per kilowatt hour (KwH) in the Cook Inlet Region comes directly from gas expenses. He said the expectation is that the cost would rise to 10 cents per KwH. He explained how cost impacts of renewable energy can be understood and integrated through their

uncertainty. He moved to slide 7, which explained how renewable energy ("renewables") can reduce costs in Alaska, the challenges associated with developing renewables in Alaska, and how Alaska could implement renewables today. He continued to slide 8, which explained the difference in cost between all of the expenses associated with renewables and the current cost of using natural gas.

[10:29:46 AM](#)

MR. DENHOLM continued his presentation on slide 9, which gave an example of a "modelling approach" to equally divide and distribute energy resources. He moved to slide 10, which showed a map of the Railbelt grid and described a future plan of action and decisions in its management. He continued to slide 11, which described hypothetical scenarios of mixed renewable and natural gas resource management. He said one of the biggest deficiencies of the analysis was a lack of data on new hydroelectric plants. He skipped to slide 13, which described "load growth," a way to describe the phenomenon of a growing population increasing energy demand in the associated region's grid.

[10:33:13 AM](#)

CHAIR RAUSCHER asked whether Alaska is comparable to the Lower 48 in terms of its electrical grid management.

MR. DENHOLM answered that in the Lower 48, every single state except for Nebraska is invested in private-for-profit utilities. He said that Alaska is unique because the main utilities providers are public entities.

[10:34:59 AM](#)

MR. DENHOLM resumed his presentation on slide 14, which described transmission and interconnection upgrades that have been made to improve the infrastructure in certain regions of the Railbelt.

[10:36:49 AM](#)

REPRESENTATIVE MCKAY asked what the terms "PV" and "ITC" mean.

MR. DENHOLM said that PV stands for solar photovotality, and ITC is the investment tax credit.

[10:37:23 AM](#)

MR. DENHOLM skipped to slide 16, which explained the importance of capturing the cost-benefit of using renewable energy. He said that historically, power is acquired through a power-purchasing agreement, which ensures the payment on an agreed price established in the agreement. He continued to slide 17, which described the previously mentioned investment tax credits that could be used towards new renewable energy projects.

[10:40:51 AM](#)

REPRESENTATIVE SCHRAGE asked how long the investment tax credit is available.

MR. DENHOLM answered that right now it is unclear, but there is a "safe harbor" provision that ensures that the credits will be awarded if a project is started by a certain date, and he offered his understanding that that date is the late 2030s, maybe 2040.

REPRESENTATIVE SCHRAGE observed that there is a limited window of opportunity.

MR. DENHOLM confirmed that is correct. He told the committee he would provide more definitive data at a future time.

[10:42:28 AM](#)

MR. DENHOLM resumed his presentation on slide 18, which explained the cost multiplier that Alaska poses when developing new renewable energy projects in Alaska.

[10:44:37 AM](#)

CHAIR RAUSCHER asked whether [solar] energy is less valuable in Alaska, with the inconsistent daylight hours and cold.

MR. DENHOLM responded that yes, solar energy is less valuable in Alaska compared to a place like California. In response to a follow-up question, he confirmed that the long days of summer in Alaska have an effect on the efficiency of solar and noted that the angle [of solar panels] must be changed to get the most amount of sunlight at any time.

[10:48:10 AM](#)

MR. DENHOLM continued his presentation on slide 19, which showed a graph of the total capital cost of renewable energy per Kwh. In response to Representative McKay, he explained that GFM stands for grid forming inverter or grid following inverter; the smaller the grid, the more difficult it is to keep stable. In response to questions from Chair Rauscher, he said he thought the Houston solar project was included in the study. He said small projects usually mean 100Mw and the number of panels it would take to power a 100Mw project is comparable to multiple football fields.

[10:53:29 AM](#)

MR. DENHOLM resumed his presentation on slide 21, which showed a map of wind development sites along the Railbelt.

CHAIR RAUSCHER asked what the difference between developers' and NREL data would be.

MR. DENHOLM answered that NREL uses data from the National Aeronautics and Space Administration (NASA) that gives a good general idea of information in a place, but local developers get more information pertinent to the area they are studying.

[10:55:32 AM](#)

MR. DENHOLM resumed his presentation on slide 22, which gave explanation on how renewables could be developed at a cheaper price than natural gas. He gave multiple examples of how additional costs could be incurred by use practices. He moved to slide 24, which raised the question of reliability benefits, of which he said there is only a small potential. He said all that renewables would do is offset the use of natural gas. He skipped to slide 26, which explained the process for finding the least expensive option for developing renewables in Alaska. He continued to slide 27, which showed a graph of cost savings between different hypothetical energy use scenarios.

[11:01:42 AM](#)

REPRESENTATIVE MCKAY asked about taxes and royalties that would be lost from less natural gas extraction in state.

MR. DENHOLM responded that the working assumption is that the state uses imported LNG, not drilling for new gas. In response to a follow-up question, he clarified that NREL is looking at the marginal resource, which is likely to be LNG.

[11:05:02 AM](#)

CHAIR RAUSCHER asked what percentage of battery cost and storage is accounted for in the study.

MR. DENHOLM answered that NREL used a minimal assumption of the value of energy storage.

[11:06:41 AM](#)

MR. DENHOLM moved to slide 28, which explained the cumulative savings of a certain scenario proposed in a previous slide. He moved to slide 29, which explained the methodology to finding the scenario with the greatest cost-benefit.

[11:08:15 AM](#)

CHAIR RAUSCHER asked Mr. Denholm to explain how the height and elevation of a wind project affects its effectiveness.

MR. DENHOLM explained the basic design of a wind turbine and how the height/elevation of the machine affects its effectiveness.

[11:10:30 AM](#)

REPRESENTATIVE MCKAY asked how these projects could be developed in the harsh climate of Alaska. He also asked how vandalism would affect the hypothetical solar panels.

[11:13:41 AM](#)

REPRESENTATIVE SCHRAGE drew attention to a February 25 article written by the Anchorage Daily News and explained the benefits that could come from these projects.

[11:15:27 AM](#)

MR. DENHOLM resumed his presentation on slide 30, which showed a map of how energy capacity would increase with the newly installed renewables. He continued to slide 31, which explained the volatility of the costs of renewables and natural gas, and how that influenced the study.

[11:17:43 AM](#)

CHAIR RAUSCHER asked whether it is possible to keep up with new technology when developing renewables.

MR. DENHOLM responded that the biggest question in developing renewables is whether it is too soon, if the next generation of renewables would be tenfold better than the current.

CHAIR RAUSCHER asked how many solar panels it takes to accomplish what one wind turbine could accomplish.

MR. DENHOLM answered that it would take 20,000 individual solar panels to produce the same amount of energy as a single wind turbine.

[11:21:38 AM](#)

REPRESENTATIVE WRIGHT asked how often renewable energy technology changes.

MR. DENHOLM replied that technology is incrementally improving, with small changes throughout the years.

[11:23:28 AM](#)

MR. DENHOLM continued to slide 32, which explained the reliability prospects of renewable energy implementation. He moved to slide 33, which he called "the scary graph," which displayed the hourly fraction of generation met by wind and solar. He skipped to slide 35, which explained the cost impacts of addressing variability and reliability associated with integrating renewables.

[11:27:18 AM](#)

CHAIR RAUSCHER asked the difference between CES and RES.

MR. DENHOLM said that the acronyms mean clean energy standard and renewable energy standard.

CHAIR RAUSCHER asked the advantage of CES versus RES.

MR. DENHOLM advised that the potential to reduce costs is the benefit. He said there hasn't been as much success as was hoped for with small modular reactors.

[11:29:51 AM](#)

REPRESENTATIVE WRIGHT asked about the study's words on micro reactors.

MR. DENHOLM responded that it all comes down to cost.

REPRESENTATIVE WRIGHT asked whether the state is moving along too early in terms of a reactor's lifespan.

MR. DENHOLM acknowledged that that is a possibility, but pointed out that it is a gain due to cost and federal funding.

[11:31:51 AM](#)

CHAIR RAUSCHER asked whether these studies are performed for each state.

MR. DENHOLM said that NREL is primarily responding to the U.S. Department of Energy's need to understand each state's energy needs. He said NREL does individual regional studies on the basis of funding. In response to follow-up questions, he noted that NREL is a not-for-profit entity funded by the federal government. In terms of whether there are biases in the studies, he responded that NREL has specific scientific integrities and policies that it follows no matter what.

[11:36:09 AM](#)

REPRESENTATIVE SCHRAGE said he was pleased that the committee is receiving a nonpartisan study.

[11:37:50 AM](#)

ADJOURNMENT

There being no further business before the committee, the House Special Committee on Energy meeting was adjourned at 11:38 a.m.