

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

February 27, 2025

1:32 p.m.

MEMBERS PRESENT

Representative Ky Holland, Co-Chair
Representative Donna Mears, Co-Chair
Representative Cathy Tilton
Representative George Rauscher

MEMBERS ABSENT

Representative Bryce Edgmon
Representative Chuck Kopp
Representative Mia Costello

COMMITTEE CALENDAR

PRESENTATION(S) : LAUNCH ALASKA

- HEARD

PRESENTATIONS(S) : CACHE ENERGY LONG-TERM ENERGY STORAGE

- HEARD

PRESENTATION(S) : SAGE GEOSYSTEMS

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

ISSAC VANDERBURG, CEO
Launch Alaska
Anchorage, Alaska

POSITION STATEMENT: Co-presented a PowerPoint presentation on Launch Alaska.

PENNY GAGE, Chief Policy and Partnership Officer
Launch Alaska
Anchorage, Alaska

POSITION STATEMENT: Co-presented a PowerPoint presentation on Launch Alaska.

ARPIT DWIVEDI, Founder
Cache Energy
Champaign, Illinois

POSITION STATEMENT: Gave a PowerPoint presentation on Cache Energy.

MIKE EROS, Chief Geoscientist
Sage Geosystems
Houston, Texas

POSITION STATEMENT: Gave a PowerPoint presentation on Sage Geosystems.

ACTION NARRATIVE

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CO-CHAIR DONNA MEARS called the House Special Committee on Energy meeting to order at 1:32 p.m. Representatives Holland, Mears, Tilton, and Rauscher were present at the call to order.

PRESENTATION(S) : Launch Alaska

[1:33:40 PM](#)

CO-CHAIR MEARS announced that the first order of business would be a presentation by Launch Alaska.

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ISSAC VANDERBURG, CEO, Launch Alaska, co-presented the PowerPoint presentation on Launch Alaska [hard copy included in the committee packet]. On slide 2, he discussed the background of Launch Alaska, which was founded in 2016. He noted that Co-Chair Holland had been one of the founding members. He stated that Launch Alaska is a nonprofit company, which initially promoted startup companies with its Accelerator Program, but its focus has narrowed to the support of the energy, transportation, and industrial sectors that work to reduce cost and emissions. He stated that Launch Alaska promotes projects by bringing companies from around the world together with infrastructure owners. In addressing Alaska's energy challenges, he expressed the belief that innovation would be the key to unlocking economic opportunities. He pointed out that Launch Alaska has

11 employees who have expertise in different areas of technology.

MR. VANDERBURG stated that Launch Alaska receives funding support from the U.S. Department of Energy and the U.S. Office of Naval Research. He added that it is also supported by many other organizations, as seen on slide 3. He noted that the company focuses on people, partnerships, projects, and policy, as seen on slide 4.

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PENNY GAGE, Chief Policy and Partnership Officer, Launch Alaska, co-presented the PowerPoint presentation on Launch Alaska. She stated that Launch Alaska's Accelerator Program is an annual, eight-month program that focuses on deploying projects on industry, transportation, and energy, as seen on slide 5 and slide 6. She noted that startup companies are currently being recruited for the program, and these startups will often offer new technologies. She noted that Alaska has a high cost of energy, extreme environments, and obvious effects of climate change. She expressed the opinion that some of the new technologies could address these challenges, while creating economic opportunities. She noted that the next two presentations would be by companies discussing geothermal energy and long-duration energy storage. She stated that the two companies have both worked with Launch Alaska. She expressed excitement about the technologies that these two companies would be discussing, as these could meet Railbelt and remote energy needs. She noted that Launch Alaska currently has 41 companies in its portfolio, while 171 companies have gone through the Accelerator Program. She added that "only the best of the best" would be part of the portfolio.

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MR. VANDERBURG, in response to a question from Co-Chair Holland, expressed the belief that startups would benefit the state because they are powerful in tackling pressing relevant issues. Concerning the energy crisis in the state, he said that startup companies are relevant because they present new pathways, such as methods for storing intermittent energy for long periods. He added that startups are also the largest job creators, and they bring in private investment. He suggested that startups are "an economic bright spot for the state," and as a sector, they are a driver for the future of the state.

MS. GAGE added that every six months the portfolio companies would be questioned on their work, such as in creating jobs, reducing emissions, and having project commitments. She noted that 77 new jobs have been reported, with 90 new projects. In response to a follow-up question on the distinction between Railbelt and rural Alaska statistics, she stated that she would report back to the committee, as this data has been tracked. She added that the companies are not just deploying on the Railbelt, but in rural communities as well.

MR. VANDERBURG, in response to a question from Representative Rauscher, expressed concern about possible impacts from frozen federal funds. He noted that the frozen funds could affect heating-cost projects, such as a project that would provide heat pumps to thousands of Alaskans. He pointed out that the hardest hit companies would be those relying on tax credits, as this could stall projects that are aimed at the state's declining natural gas supply.

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MS. GAGE, in response to a question from Co-Chair Holland, stated that the application deadline for the Accelerator Program would be May 1. She noted that industry, transportation, and energy projects have been chosen in the past because these are the sources of the highest emissions in the state. She stated that Launch Alaska is interested in mid-to-late-stage startups that are ready for customers, as this shows market traction. She stated that Launch Alaska's team evaluates the applications, along with an external review company, which consists of experts in the various fields. She pointed out that the process is phased.

CO-CHAIR MEARS discussed the need for seasonal energy storage in the state.

PRESENTATIONS (S): Cache Energy Long-term Energy Storage

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CO-CHAIR MEARS announced that the next order of business would be a presentation from Cache Energy.

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ARPIT DWIVEDI, Founder, Cache Energy, gave a PowerPoint presentation on Cache Energy [hard copy included in the

committee packet]. He stated that Cache Energy is working on solutions for long-term energy storage. He expressed the opinion that the two main problems in Alaska are the natural gas storage and the need for long-term seasonal energy storage, as seen on slide 2. He asserted that the intermittency of solar and wind energy often leads to overbuilding or underutilizing, as seen on slide 3. He expressed the opinion that the only solution at the present is to use lithium-ion batteries; however, this storage is not scalable. He explained that these batteries cannot store a bulk of energy, and buying excess batteries would not be cost effective. He also discussed how these batteries lose capacity with time. Noting Alaska's harsh climate, he said that solutions in the Lower 48 could not always be implemented in Alaska.

MR. DWIVEDI moved from slide 4 to slide 5 and discussed Cache Alaska's approach to fuel storage. He stated that it promotes a proven technology that is comparable to fossil fuels, and he noted that fossil fuels are a low-cost source of shippable energy. He stated that this proven technology is like coal, but it would not have the consequences, and it is rechargeable. He continued, stating that this new technology would be like a battery, but with the features of fuel. On slide 6, he explained the chemistry behind the new technology, which involves storing and releasing cheap energy by dehydrating and rehydrating lime. He continued that, because the lime cannot be reused, Cache Alaska came up with the solution of turning lime into stable pellets, which create cyclability. He expressed the understanding that these pellets could be discharged and recharged thousands of times. He noted that Cache Alaska has won prizes for developing this technology. He discussed a pilot program that took place in Anchorage using the technology, and he showed the committee a short video demonstrating this [link to the video provided on slide 7].

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MR. DWIVEDI pointed out that there are many ways to store energy, and he argued that using lime would provide the duration needed in harsh weather conditions. He asserted that as long as the pellets are contained, they would not lose energy. He pointed out that lime is cheap, and it does not require extreme heat to bring up the temperature, so stainless steel could be used for this. He pointed out the graph on slide 8 that showed a cost comparison. He expressed the understanding that using lime for heat storage would be one third of the cost of using

batteries. He noted that this is targeting heat and not electricity.

MR. DWIVEDI moved to slide 9 and discussed the storage of the lime pellets. He noted that the pellets could be stored in basic containers, as the lime can withstand extreme weather conditions, even in Prudhoe Bay. He moved to slide 10 and discussed project ideas for using this technology, and he pointed out that currently Cache Alaska is looking for areas with a cheap source of intermittent excess energy generation. He pointed out that Cache Alaska has been working with Chugach Electric, the Municipality of Anchorage, and on a project in Kotzebue. He discussed the process of tying this technology into an already existing system. He pointed out that because lime is cheap, the driving factor for cost would be transportation. He noted that producing the pellets close to customers would be beneficial, so a critical number of customers would be needed to promote building a factory in the state. He added that once the company has a customer base in the state, it could obtain the limestone locally. He moved to slide 11 and pointed out Cache Alaska's partners. In conclusion, he suggested that the larger energy projects in the state should continue, while smaller, low-cost projects could be done in conjunction with Cache Alaska, as this technology is ready to deploy.

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REPRESENTATIVE RAUSCHER questioned the amount of water needed to make heat from the lime pellets.

MR. DWIVEDI responded that an exact amount of water would need to be added to the lime pellets to obtain the right temperature. He continued that the amount of water could be changed to raise or lower the temperature, as needed. In response to a follow-up question, he stated that if the stored pellets became wet, a warm puddle would be created, or if steam were created, a thermal runaway would be needed. He added that the pellets have a thermal limit of 1000 degrees Fahrenheit, and the reaction would stop there. He pointed out that when coal, oil, and gas grow hotter, they burn faster, and they would need a thermal runaway. He responded that the pellet container would not become hot enough to melt.

CO-CHAIR HOLLAND questioned the environment needed [within communities] to support innovative technologies. He noted the

regulations surrounding utility companies, along with the cost associated with the utility companies.

MR. DWIVEDI expressed the belief that the technology developers would need to earn the trust and confidence of communities. He expressed the opinion that there should be healthy skepticism concerning any energy production. He asserted that Cache Alaska has worked to earn confidence by shipping its pilot project to Alaska and opening the process up for the public to see. He stated that another way to create trust would be to have a lease program for communities who find it hard to make the investment. He opined that there needs to be openness to shifts in industry; otherwise, a sunk-cost fallacy would be created.

MR. DWIVEDI, in response to a question from Representative Rauscher, stated that when charging and discharging the pellets, they are never wet. He clarified that vapor would be passed over the particles, not liquid water. He explained this process in more detail.

MR. DWIVEDI, in response to a question from Co-Chair Holland concerning the cycle process, explained that this technology is flexible, as the design allows it to be charged or discharged in any amount needed. In response to a follow-up question, he stated that 1 unit of pellets would create 100 kilowatts of energy, which would equal around \$100,000.

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CO-CHAIR MEARS, concerning the size of a unit, discussed the variables in shipping and usage. She questioned whether this would depend on the application.

MR. DWIVEDI responded that this would depend on the size of the community, as a bigger community would need a larger reactor, or charger. He continued that the number of pellets needed would depend on the length of time the energy is needed. He explained that a full shipping container could be used, depending on the seasonal extremes in Alaska.

CO-CHAIR HOLLAND questioned the space needed for the reactor and the storage of the pellets. He questioned the community size that could benefit from this technology.

MR. DWIVEDI responded that to be economically viable, there would need to be a minimum limit of around 50 houses, equating to 100,000 megawatts. Concerning the benefit for communities,

he stated that the higher the heating price a community has, the more the benefit. He added that the impact on cost would be greater if a community has cheaper energy part of the year. In response to a follow-up question on storage, he stated that one shipping container could be used through a few months of very cold weather for a community of 100 people. He reminded the committee that this is not a fuel, but a rechargeable resource that would not require yearly shipments.

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CO-CHAIR MEARS expressed the understanding that heat would be the ideal product. She questioned whether larger scale projects could use this technology.

MR. DWIVEDI responded that retrofits studies on larger projects are being done in the Lower 48. These projects are looking at converting heat into electricity. He noted that one of these studies is looking at using a decommissioned 600-megawatt coal plant.

MR. DWIVEDI, in response to a question from Co-Chair Holland, expressed uncertainty on the capacity for the recovery generator at the new Chugach Electric plant. He stated that he would follow-up with the answer to this question after the meeting.

MR. DWIVEDI, in response to a question from Representative Rauscher concerning the end of life for the pellets, stated that with each cycle, there would be some breakdown, but they are still able to store energy. He explained that the storage comes from the lime, and the storage capacity would not change, but after a few hundred cycles, the lime becomes too small. He stated that this equates to two years of daily usage. He added that the breakdown turns into powder, and the pellets could be remade cheaply from this powder. In response, he stated that one barrel of pellets would have the same density as water.

PRESENTATION(S) : Sage Geosystems

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CO-CHAIR MEARS announced that the final order of business would be the Sage Geosystems presentation.

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MIKE EROS, Chief Geoscientist, Sage Geosystems, gave a PowerPoint presentation on Sage Geosystems [hard copy included in the committee packet]. He shared his qualifications, which included work at Exxon Mobile. He stated that he joined Sage Geosystems in 2021. He pointed out that Sage is staffed with former employees of the oil and gas industry, and its focus is making long duration energy storage that could be used for heating. He stated that its focus especially involves using geothermal heating and energy storage.

MR. EROS reviewed Sage's team, as seen on slide 2. He noted the company's goal of securing independent capital to test the economic viability of low-cost energy supplies. He expressed the understanding that these supplies need to be de-risked before they are brought to the market. On slide 3, he covered Sage's timeline, pointing out that the company was created in 2020. He discussed Sage's funding sources, which included funding from climate change philanthropists. He added that it has also secured funding from Nabors, which is the largest owner of land rigs in the world. He stated that Sage has raised around \$55 million in the last 3 years, and it has spent around \$45 million on testing geothermal energy storage. He discussed the progress towards a demonstration project, pointing out that Sage has an agreement with META to provide geothermal power on a pilot scale by 2027. He noted that Sage would be ready to provide energy solutions to the market in around 12-to-14 months.

MR. EROS discussed the map on slide 4, which showed the geothermal heat flow and geothermal energy storage potential in Alaska. The map highlighted the Railbelt and the major power grids, and it also highlighted sedimentary basins in the state. He stated that these type basins could be drilled for less cost and used for subsurface energy storage. He discussed the needed scale, which would be more than 500 kilowatts for stored energy.

MR. EROS moved to slide 5 and discussed Sage's two main product lines, which are energy storage and geothermal energy. He noted that he would focus mainly on energy storage, as these projects are shovel ready. He stated that the first plant has been built in Texas, and it is currently being tested. He noted that this technology could also be applied to the future use of geothermal. He discussed the first diagram on the slide, explaining that the injection and production processes would happen within the same well. He continued that there would be a timestep between the process of injecting water into a deep well and the process of pumping it back to the surface. He pointed

out that grid power from various sources would be used to do this. He continued that, once the water is injected, high pressure would be created in the formation. The water would then be ejected through the casing at about 5000 pounds per square inch, and this would turn the turbine, which turns the generator and puts power back on the grid. He stated that the pump would be the biggest energy load, adding that the system has around 75 percent efficiency.

MR. EROS discussed the geothermal process, shown on the right side of slide 5. He pointed out that this process has not been field-tested. He stated that it has the same set up, using a vertical well, but the well would need to be five times the size of the energy storage model. Concerning the scale of applicability, he stated that this system would serve villages with the population of around 1000 people. This population would justify the needed size of a well to produce around 500 kilowatts.

MR. EROS moved to slide 6 and noted that Sage is doing projects with the U.S. Department of Defense. He stated that these projects involve gathering data on application risk factors. He stated that it has secured funding for geothermal testing with the U.S. Airforce, and the project should begin in 2025 in Texas. He expressed the understanding that the military is concerned about securing energy assets and lowering energy costs across the country.

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MR. EROS, in response to a question from Representative Rauscher concerning the cost to a community for project installation, stated that Sage is working to be competitive with the price of natural gas, coal, and other power sources. He discussed the variables in the price projection in Texas, noting that this could be higher in Alaska.

REPRESENTATIVE RAUSCHER noted that Texas is flat and populated, while Alaska is not. He expressed the opinion that the cost in Alaska would "escalate" from the projected cost in Texas. He questioned whether the discussed cost would be relatable to Anchorage.

MR. EROS expressed the understanding that this would be a "fair assumption." He further speculated on other scenarios. In parsing out the cost, he expressed the opinion that the 20 percent needed for engineering, procurement, and design would

likely increase in an application in Alaska. He opined that there could be advantages that Alaska might have over Texas. In response to a follow-up question from Co-Chair Holland, he stated that the required drilling would not involve the larger rigs, as this energy storage would only require a 9,000 foot well. He added that rigs are being made more mobile and lightweight.

MR. EROS moved to slide 7 and pointed out the turbine/generator used in San Antonio, Texas. He stated that this is used by the San Miguel Electric Cooperative to diversify its energy portfolio by building on 2 megawatts of solar within the next 10 years. He noted that Sage has a lease to work on this project.

MR. EROS moved to slide 10 to discuss the potential for geothermal energy in Alaska. He pointed out that Sage is partnered with GeoAlaska, as GeoAlaska is securing a lease to drill on Augustine Island. He stated that GeoAlaska would be involved with the geothermal portion, while Sage would be working on the hot dry rock process. He pointed out the conventional geothermal system, as seen on the slide. He stated that this relies on the system being close to volcanos, where the production rates are unreliable and exploration is expensive; therefore, new geothermal projects are being developed, including using the hot dry rock process. He noted that Sage is developing a hot rock system that has lower cost and higher efficiencies. In conclusion, he expressed appreciation to Sage's investors, as seen on slide 13.

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CO-CHAIR HOLLAND questioned any barriers in Alaska that Sage foresees, especially concerning the needed landscape and access to the underground. He questioned any regulatory work that might be needed.

MR. EROS responded that Sage seeks to be competitive with other energy resources, especially concerning parity with oil and gas regulations. He expressed the opinion that, in general, Alaska has a favorable environment. He noted that, concerning utilities in the state, it would be helpful to have a discussion on leveling the cost of storage and energy, so alternative energy systems could be compared equally with traditional systems. He pointed out that this would concern the cost to make a system and the net-life benefit that results from this system. He expressed the understanding that there might be opportunities in Alaska unknown to Sage. Concerning these

opportunities, he suggested that Sage could provide a public benefit.

CO-CHAIR HOLLAND pointed out that Sage's team has many years of experience working in the oil and gas industry. He questioned the role of this experience in the transition to newer energy systems.

MR. EROS, in response, encouraged committee members to research Jamie Beard, as she is the person who has suggested that oil and gas professionals could be the future of renewable energy. He stated that there is an 80 percent overlap with the required skills in the renewable and fossil fuel sectors. He suggested that oil and gas entities are seeing the commerciality of the innovative solutions.

CO-CHAIR MEARS spoke to the complexity of the future of energy. She expressed appreciation to the presenters and made closing comments.

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ADJOURNMENT

There being no further business before the committee, the House Special Committee on Energy meeting was adjourned at 2:58 p.m.