

**DOCKETED**

<b>Docket Number:</b>	22-ERDD-02
<b>Project Title:</b>	Climate Innovation Program
<b>TN #:</b>	247792
<b>Document Title:</b>	Muon Space, Inc Comments - Climate Innovation Program response from Muon Space
<b>Description:</b>	N/A
<b>Filer:</b>	System
<b>Organization:</b>	Muon Space, Inc
<b>Submitter Role:</b>	Applicant
<b>Submission Date:</b>	11/29/2022 4:37:30 PM
<b>Docketed Date:</b>	11/29/2022

*Comment Received From: Muon Space, Inc*  
*Submitted On: 11/29/2022*  
*Docket Number: 22-ERDD-02*

## **Climate Innovation Program response from Muon Space**

*Additional submitted attachment is included below.*



2250 Charleston Rd. Mountain View, CA 94043

From: Cameron Matthews, Muon Space Inc

Date: 11/29/2022

Subject: Response to request for comment on CEC Climate Innovation Program

To whom it may concern,

On behalf of Muon Space Inc, a California-based company building a constellation of remote-sensing satellites for environmental monitoring, we want to thank you for the opportunity to attend the workshop and comment on the Climate Innovation Program. Please find responses to the prompt questions and other comments below.

We want to first commend the State of California and the Energy Commission for recognizing the need for innovation to respond effectively to our changing climate. This and related grant programs are a welcome and necessary investment.

The transition to a decarbonized and climate resilient California economy requires substantial structural changes to the economy. We would like to see grant programs such as this one structured to catalyze industry to build long-term operational systems and products, preferably with a direct line of sight to the State of California as an enduring customer for these innovations. If done properly, State of CA investments can set in motion a positive feedback loop where early investments begin achieving climate goals and spurring new markets, CA-based companies grow to serve these new markets, and State climate, environment, and energy efforts benefit directly from the innovations.

In our opinion, and the reason for founding Muon Space, the most critical development that needs to happen to mitigate and deal with the effects of climate change is an explosion of new and more frequent environmental data. Our environment, especially here in California, is subject to new threats that legacy data and models don't adequately account for.

We need rapid wildfire detection and monitoring to efficiently deploy firefighting response, protect critical infrastructure, and direct recovery resources. We need high frequency snow and water monitoring to manage our natural resources for a diverse set of California interests and provide better forecasting for things like hydropower production (an aircraft LIDAR survey of the snowpack once every three years is not sufficient). We need open ocean monitoring to improve models of atmospheric river events and other weather phenomena specific to California. And much more.

Federal agencies like NOAA and NASA play an important role, but are not primarily focused on the needs and timelines of California. New efficiencies in commercial satellite systems make it possible for these data to be collected rapidly and affordably by private companies and NGOs,

and California has an opportunity through programs like this to accelerate that development by funding R&D and catalyzing markets for the data.

Given this grant's focus on the initial innovation stage, it's critical that investment is structured to enable and incentivize stakeholders including for-profit companies to implement and operationalize these advances.

Responses to discussion prompts from the workshop:

*What criteria should the CEC use to evaluate eligible technologies?*

- New data as the foundation of any decarbonization & resilience plan.
- Readiness/ability/speed/cost of new innovations to deploy into operational systems at scale.
- Ability of the technology to catalyze other climate innovations, creating an exponential impact.

*What is your top-priority technology topic where you believe the most funding and emphasis should be placed because it could have the most significant impact (and why)?*

- New measurements to map, monitor, and predict the changing environment, human actions, and the interactions between the two. This would include topics such as wildfire and drought prevention and response, GHG emissions monitoring, weather prediction and monitoring, natural resource management, water management, etc. These technologies will not only be directly beneficial to CEC and other state agencies by improving resiliency, but also will catalyze further technology innovation from the private sector.

*What important gaps are not being addressed by other funding programs?*

- Funding to study what new data are required for top-priority climate challenges, and to develop detailed plans of the technology and observation systems required to provide these new data. These studies are an excellent fit for an innovation grant program, and are a precursor for follow-on funding from other grant programs to build and operate the new systems.
- A dedicated operational transition path for technologies for which the State of California would benefit directly from as a customer. The Defense Innovation Unit (DIU) is a good example of this kind of transition program at the Federal level, accelerating both the R&D and navigating bureaucratic contracting that can be challenging for startups and other businesses.

*What other suggestions would you like the CEC to consider in the development of this program?*

- It was not apparent what the expected min/max award sizes would be for the program. We believe a phased approach is effective, with a short Phase 1 initial study contract of 6-12 months and a minimum award of approximately \$200k. Following this is Phase II prototyping contract, at roughly 12-24 months and 5-10x the award size. Phase III provides commercialization support and transition to an operational contract with the state, if applicable.

- Echoing what others said in the webinar, the repayment requirement if the recipient experiences a liquidity event creates a substantial blocker for early-stage for-profit companies. For venture-backed startup companies like ours, a liquidity event is the default path, which makes grants from this program function as long-term loans, not grants. Large grant proposals would be a non-starter, and small grant proposals would likely not be cost-competitive with other funding programs. Overall, this requirement would likely prevent many for-profit companies from participating in the grant program, which we believe under-cuts the overarching goals of the program as discussed above. If repayment is a legislative requirement that cannot be changed, the risk to private companies can be somewhat mitigated by providing a structured path to transition to a procurement or operational services contract with the State for the technology after the grant period of performance has concluded, as described above.
- For the requirement “Awardees must be CA-headquartered companies,” the webinar mentioned a 10 year requirement. It was not immediately clear whether this meant the company must be presently headquartered in CA, and the headquarters must remain in CA for the next 10 years following any award under this program. If that is the case, and a change in headquarters triggers a required repayment, that places burdens on the company that make the program less attractive. While we understand the desire of the State to support California business, it would be helpful to allow businesses to at most maintain a California presence rather than full company headquarters.
- *Proposal process and timeline:* For applying companies, it’s very important to minimize the timeline from RFP submission to knowing if you’re moving forward. We recommend adopting a multi-phased proposal process with several progressively more involved steps applied to a narrowing field. For example: i) Step 1 - quick pitch with a “2-pager” proposal; ii) Step 2 - selected participants are invited to submit a full written proposal; iii) finalists are invited to present to the selection committee; then funding decisions are made within a few weeks to a month.

Thank you for your time and consideration of comments,

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