Written Testimony

TO: Members of the Maryland Senate EEE Committee
FROM: Dr. Ning Zeng, Professor at the University of Maryland and Co-founder of the Carbon Lockdown Project
DATE: March 10, 2026
RE: Support for SB0625 – Carbon Removal Technology and Practices - Regulations and Use of Funding

Introduction: The Need for a Broad CDR Framework
My name is Ning Zeng. I am a Professor at the University of Maryland and co-founder of the Carbon Lockdown Project. I am writing to express my strong support for **SB0625**. This legislation is a critical step in establishing a regulatory environment for Carbon Dioxide Removal (CDR) in Maryland. As the state pursues its ambitious net-zero goals, we must create a clear pathway to facilitate the transition of carbon removal technologies from the laboratory to commercial scale.

The Scientific Imperative: Global and National Context
The consensus among the global scientific community, reinforced by the UN IPCC and the U.S. National Academy of Sciences, is that gigaton-scale carbon removal is no longer optional; it is a mathematical necessity to mitigate the most catastrophic impacts of climate change. Just like renewable energy, CDR creates a trillion-dollar industry. **CDR includes** a diverse portfolio of carbon removal technologies—ranging from high-tech industrial capture to nature-based solutions.

Wood Vaulting as an Example
To understand the importance of this bill, one can look at the example of **Wood Vaulting**. This is a hybrid nature-engineering method that leverages the natural photosynthetic capacity of trees to capture CO2. Wood residuals are then buried within engineered 'vaults' to prevent decomposition, forming an effect carbon sink. 15 years of research and pilot projects have demonstrated the method to be a low-cost, practical carbon removal method that can be scaled to gigaton scale within a decade. Estimated potential for just this technology at Maryland is 1.2 mega-tonne per year, equivalent to taking 300,000 cars off the road.

The technology was invented at the University of Maryland which continues to lead the world in this burgeoning research field. Over a dozen companies worldwide are currently implementing the technology, including UMD startup Carbon Lockdown.

Socio-Economic Benefits of Wood Vaulting
The implementation of SB0625 extends benefits far beyond carbon removal:

- **Waste Utilization:** Wood Vaulting does NOT encourage deforestation. On the contrary, it encourages sustainable forest management to improve forest health. It uses only residual un-merchantable biomass. It transforms underutilized wood residuals and storm debris into high-value assets.
- **Fire Prevention and Public Safety:** Reduces the accumulation of combustible biomass piles in urban and forest-fringe settings.

- **Air Quality Preservation:** Prevents uncontrolled biomass fires and the associated release of harmful pollutants and methane generation in mulch piles.
- **Rural Economic Development:** Through partnerships of different agencies and universities, this framework will catalyze the creation of specialized, high-paying technical jobs in Maryland's rural agriculture, forestry, waste management, and construction sectors.

The Frontline Reality: Missed Opportunities at Camp Small
As a startup founder in this space, I see the real-world consequences of our current lack of regulatory clarity. A tragic example is the recent fire at **Camp Small**, Baltimore's wood recycling hub on Dec 5, 2024. Thousands of tons of wood residuals went up in smoke, releasing carbon and pollution into the atmosphere.

Under a robust regulatory regime such as the one proposed in SB0625, that material would not be viewed as "waste" to be piled up, but as a valuable climate asset. With proper permitting and oversight, these **wood residuals** could have been diverted to projects, turning a fire hazard into a permanent carbon sink.

Regulatory Challenges and the Startup Perspective The primary hurdle for CDR startups in Maryland is not the science—which is well-established in peer-reviewed literature and governed by multiple international standards and independent verifiers—but the **regulatory "gray zone."** Currently, innovative carbon removal projects are often forced to navigate rules designed for waste management or traditional construction.

I'm aware of several imminent opportunities in Maryland that could be implemented to achieve climate and multiple co-benefits, including:
- **Western Maryland**: The closing of the only papermill is causing a decline of a whole industry in the region. Utilizing the forest resources for CDR can provide a lifeline for local economy.
- **Remediation of sand and gravel pits and end-of-life mines:** Thousands of sites across the state.
- **Washington-Baltimore Metropolitan area:** Urban waste wood (backyard tree removal, etc) has overwhelmed our waste management capability, leading to Camp Small fire, mulch pile explosion, etc. Bury them is a 'two-birds with one stone' solution.

To scale CDR, we need a framework that:
- **Differentiates Residuals from Waste:** Provides a clear legal distinction for materials intended for permanent carbon storage.
- **Adopts High-Integrity Standards:** Incorporates existing scientific protocols and international standard to ensure every ton of carbon removed is verified and durable. We also need ensure that unintended negative impacts are avoided or minimized.
- **Provides Permitting Certainty:** Allows startups to attract the investment necessary to build the infrastructure Maryland needs to meet its climate mandates.
- **Support pilot projects:** Accelerate the deployment through 'learning by doing'.

Other states like **California and New York** are also moving to regulate and incentivize CDR. Maryland shouldn't just follow—we should lead. We have technology invented by state

universities, we have the startups, we have Climate Solutions Now Act (SB528, 2022), state organizations like MCEC and MEIA.

Conclusion SB0625 is not just about one technology; it is about building the infrastructure for a new carbon economy. By providing a clear regulatory home for CDR and support pilot projects, Maryland can prevent future losses like the Camp Small fire and instead lead the world in durable, low-cost climate solutions. I urge a favorable report on SB0625.

References

Selected Research

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Methodologies, International Standards, US legislations

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- Puro Methodology on Terrestrial Storage of Biomass Edition 2023 v1, November, 2023.
- Isometric Standard on Subsurface Biomass Storage, v1.0, September 2024.
- **California SB 308 – Carbon Dioxide Removal Market Development Act**

Media coverage and commentary

- Scientific American: Can We Bury Enough Wood to Slow Climate Change? October 16, 2025.
- Woody Biomass Burial, Illuminem, by Wil Burns, June 3 2025
- Washington Post: A cheap, low-tech solution for storing carbon may be sitting in the dirt Sep 25, 2024

- Coverage by national and international media outlets (50+) listed on Altmetric
- USDA webinar: Wood Harvesting and Storage (Wood Vault): A low cost and easily scalable way to remove atmospheric CO2 to fight climate change, May 12 2023, 49min including Q and A.
- Construction of the world's first commercial-scale Wood Vault, Potomac Project Phase 1 by Carbon Lockdown at Northern Maryland, Nov 13, 2023. youtube video, 4min.
- WBAL, Dec 5 2024: 'Could have saved all that wood': A professor's project might have prevented Camp Small fire