



UNIVERSITY OF MARYLAND

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Maryland Energy Innovation Institute

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Maryland Energy Innovation Institute (MEI²) was created in 2017 through an Economic Development Act (HB410/SB313) of the Maryland General Assembly. MEI² works in partnership with academic institutions across the state to help attract federal and private support of Maryland energy research and innovation, with the specific economic development goal of commercializing emerging and transformative advanced clean energy technologies in Maryland.

Bill Number: SB0960 / HB1220

Title: Maryland Clean Energy Center – Climate Technology Founder’s Fund

Hearing Date: March 26, 2024

Committee: House Appropriations Committee

Recommend: FAVORABLE REPORT

Clean energy technology plays a pivotal role in addressing climate change, offering a sustainable alternative to fossil fuels that significantly reduces greenhouse gas emissions. As the global population grows and energy demand increases, transitioning to clean energy sources such as solar, wind, hydroelectric, and geothermal power is essential to mitigate the adverse effects of climate change. Clean energy technologies not only reduce carbon emissions but also help to improve air quality, protect ecosystems, and enhance energy security. By investing in clean energy technology, we can curb the progression of climate change, create green jobs, and build a more sustainable future for generations to come.

The nucleus of the Maryland Energy Innovation Institute’s (MEI²) success lies in its world-class researchers, whose expertise spans a spectrum of cutting-edge domains, including battery and fuel cell technologies, biofuels, advanced materials, energy storage, and building and heating energy efficiency. Their collective knowledge and groundbreaking contributions empower us to stay ahead in the rapidly evolving landscape of sustainable energy solutions.

One of our standout capabilities is the adept handling of the energy seed grants, which have consistently translated into a high return on investment. These grants serve as catalysts for pioneering research and development projects, fostering innovation and enabling us to bring transformative ideas to fruition. The strategic allocation of resources through these grants exemplifies our commitment to driving impactful advancements in the energy sector.

However, a notable constraint lies in our limited sources of funding, which are currently short-term and small scale. Energy seed grants are \$100-200K for one year and only for early-stage development of technologies. This financial constraint can impede the sustainability of long-term products/services and hinder the potential for groundbreaking advancements. Exploring avenues for diversified and more substantial funding streams is crucial to ensuring the viability and continuity of our initiatives.

Additionally, the need for more incubators and manufacturing space is an urgent concern. As our initiatives gain momentum, the existing infrastructure is insufficient to accommodate the growing demand for space dedicated to research, development, and manufacturing. Addressing this limitation is pivotal to sustaining and scaling our innovative projects effectively.

Since inception, state funds invested in MEI² and MEIA totaling \$6 million helped establish an energy innovation ecosystem that produced 37 new companies and created 134 new high-paying jobs in the State of Maryland. Moreover, this state, university, and private sector partnership has helped bring to Maryland over \$214M in non-dilutive grant funding and \$70M in private investment, resulting in an estimated 47X return on investment (ROI).

With additional funding from SB0960 / HB1220, the following programs/objectives could be achieved:

- Increase Number and Amount of awards to Seed Grant Applicants, with a focus on more awards to Minority Serving Institutions
- Phase 2 Prototype Accelerator
- Phase 2 Manufacturing Accelerator
- MCEC Founders Fund Phase 3
- Incubation programs for local entrepreneurs; including Incubator Partnerships for Tenant Finish Investments (Phase 4 funding)
- Workforce Development and Training with Industrial Partners including establishing hands-on training programs that bridge theoretical knowledge with practical application especially for minority serving institutions

More specifically on the seed grants program, in the first six years, 57 seed grant proposals were submitted while only 27 were able to be funded due to budget limitation. Although this demonstrates a 47% acceptance rate, increased funding will allow the Maryland Energy Innovation Institute to fund more of these quality proposals. Moreover, a focus of the additional funding would be placed on minority serving institutions that submit proposals. To date, 9 energy seed grant proposals have been submitted to the Maryland Energy Innovation Institute from minority serving institutions, and 5 have been funded.

Passage of this legislation will put resources to work and would be taking another step toward Maryland achieving economic competitiveness.

The Maryland Energy Innovation Institute urges a favorable report for SB0960/ HB1220 and thanks Chairman Feldman and Delegate Vogel for their leadership in sponsoring this legislation.

Yours sincerely,



Eric D. Wachsman, Ph.D.
Distinguished University Professor
Director, Maryland Innovation Institute
William L. Creutz Centennial Chair in Energy Research
University of Maryland
*Past President, The Electrochemical Society
Fellow, National Academy of Inventors*

Maryland Energy Innovation Institute

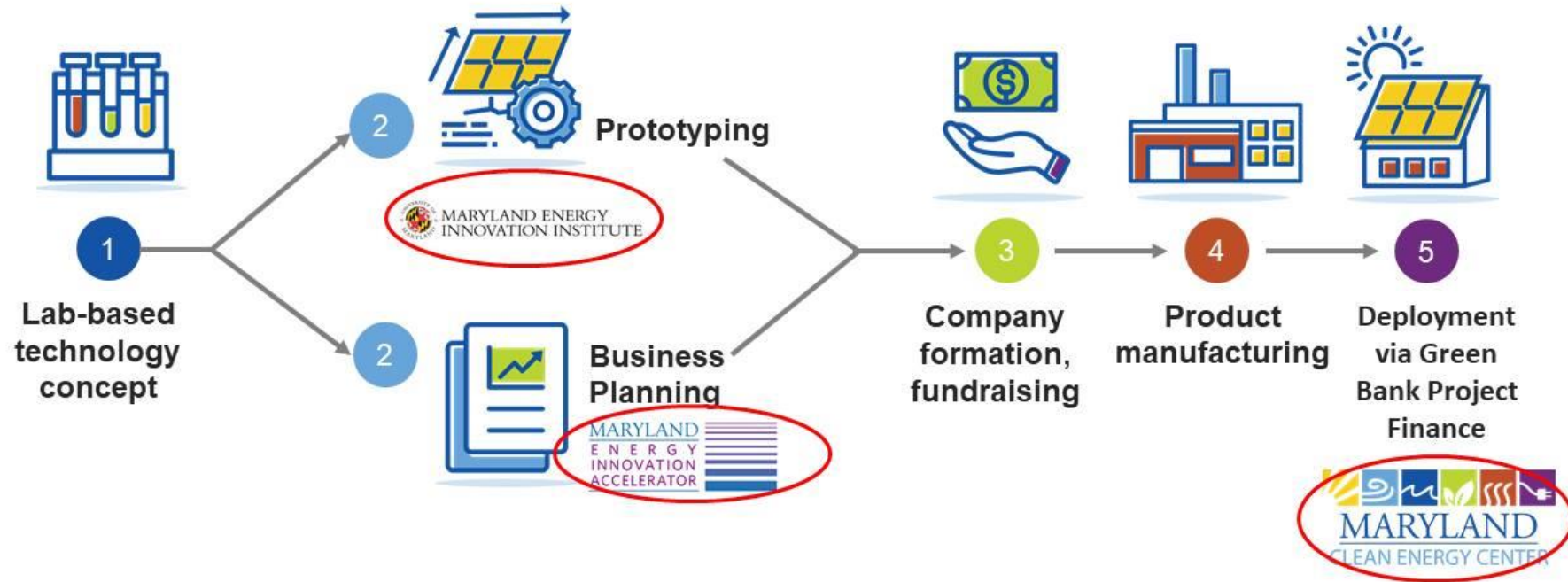
Eric D. Wachsman, Director MEI²

Paul Albertus, Associate Director MEI²

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House Appropriations Committee Testimony for SB0960/HB 1220

Advanced Energy Commercialization Concept to Deployment



Transforming MEI² Research to Innovation

Economic Development by the Numbers for MEI² Activities and Seed Grants, and MEIA Companies

- 37 Companies Formed
- 134 F/T Jobs created
- 124 Patents Filed
- \$70.3M Private Investments
- \$214M in Federal Grants Awarded
- \$4.5M Revenue Generated

MEI² Investment Committee

Ellen Williams, UMD Distinguished University Professor, Former Director ARPA-E (DOE)

Ken Porter, Director, UM Ventures

Eric Chapman, Asst. Vice-President of Research, UMD

Rob Briber, Interim Dean, A. James Clark School of Engineering

Arti Santhanam, Exec. Director Innovation Initiative, TEDCO

Colleen Wright, Vice-President of Corporate Strategy, Constellation

Transforming MEI² Research to Innovation

MEI² Innovation Seed Grants

- Bridge the gap between transformative academic research and VC-Ready Proof-of-Concept
- Advance energy technology and economic growth of Maryland university spin-off companies
Must have appropriate IP protection and commercialization plan.
- In first six years 27 seed grants were awarded (22 Phase I and 5 Phase II)
- Demand for these seed grants has grown rapidly far exceeding current budget to support
- Several have resulted in follow on private investment.
- Total Awards Submitted: 57 Total Recipients: 27 Acceptance rate: 47%
- Minority Serving Submitted: 9 Total Recipients: 5 Acceptance rate: 55%

Increasing the Energy Innovation Ecosystem



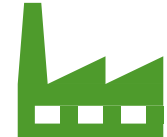



Increased Funding would be used to:

- Increase Number and Amount of Awards to Seed Grant Applicants with a focus on more to Minority Serving Institutions
- Phase 2 Prototype Accelerator
- Phase 2 Manufacturing Accelerator
- MCEC Founders Fund Phase 3
- Market Research/ Due Diligence Support Grants
- Incubator Partnerships for Tenant Finish Investments Phase 4
- Workforce Development and Training with Industrial Partners

Transforming MEI² Innovation to Jobs

ION⁺

ION is commercializing its low cost, energy dense, fast charging, safe, and versatile solid-state batteries with a goal of sustained GWh-scale production.

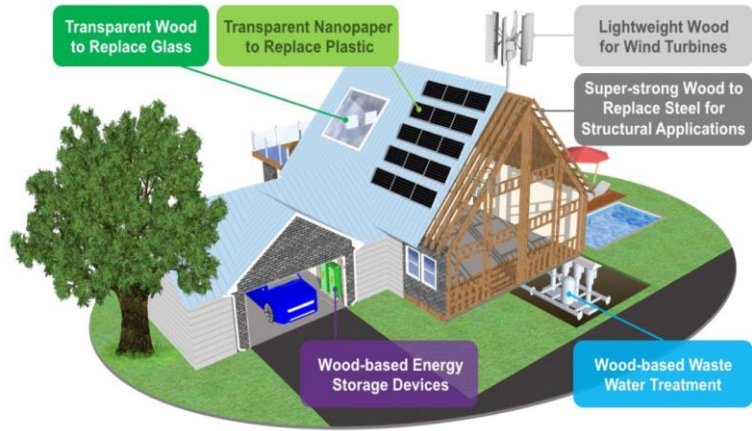
 Inc. Founded 2019	 Employees 70+	 Facility 30k sqft (MD, USA)	 Funding \$42M in VC Funding
 Dev. Partners 8 <u>\$10.8M Nondilutive</u>	 Customer Pipeline 30+	 Patents 23 Issued 28 Pending	 Cells produced 1000's of pouch cells

• Selected as “Maryland Future 20” company

Disclaimer: Ion Storage Systems founded by Wachsman and this is meant as only an example of potential spinoffs and not an endorsement of this company or request for any support on its behalf

Transforming MEI² Innovation to Jobs

InventWood™
From Nature | For the Future



Revolutionary Technology, Millions of Years Old

InventWood is transforming the world by developing cellulose-based materials that are high-quality, cost-effective, and environmentally-sustainable. Our proprietary technologies offer superior alternatives to the most commonly-used materials today while providing solutions to some of the world's most intractable environmental challenges.

- Moved into manufacturing facility in Frederick, MD
- \$22M in follow on federal funding
- \$3.2M in private investment

Revolutionizing Sustainable Building Materials

MettleWood™



An extremely strong and tough material that is stronger, lighter, and cheaper than titanium and carbon fiber. It also offers numerous safety benefits over alternatives, and it is responsibly created and biodegradable.

Potential uses:



Insulating Wood



A bright-white material that is stronger than natural wood and insulates against both heat loss and impacts better than commercially available alternatives. It is also biodegradable and eco-friendly.

Potential uses:



Transparent Wood



A clear wood material that is lighter and tougher than glass, with up to 3x better thermal insulation. It also offers benefits in terms of both light channeling (to reduce glare) and far more environmental sustainable.

Potential uses:



- Selected as “*Maryland Future 20*” company