Maryland Energy Innovation Institute

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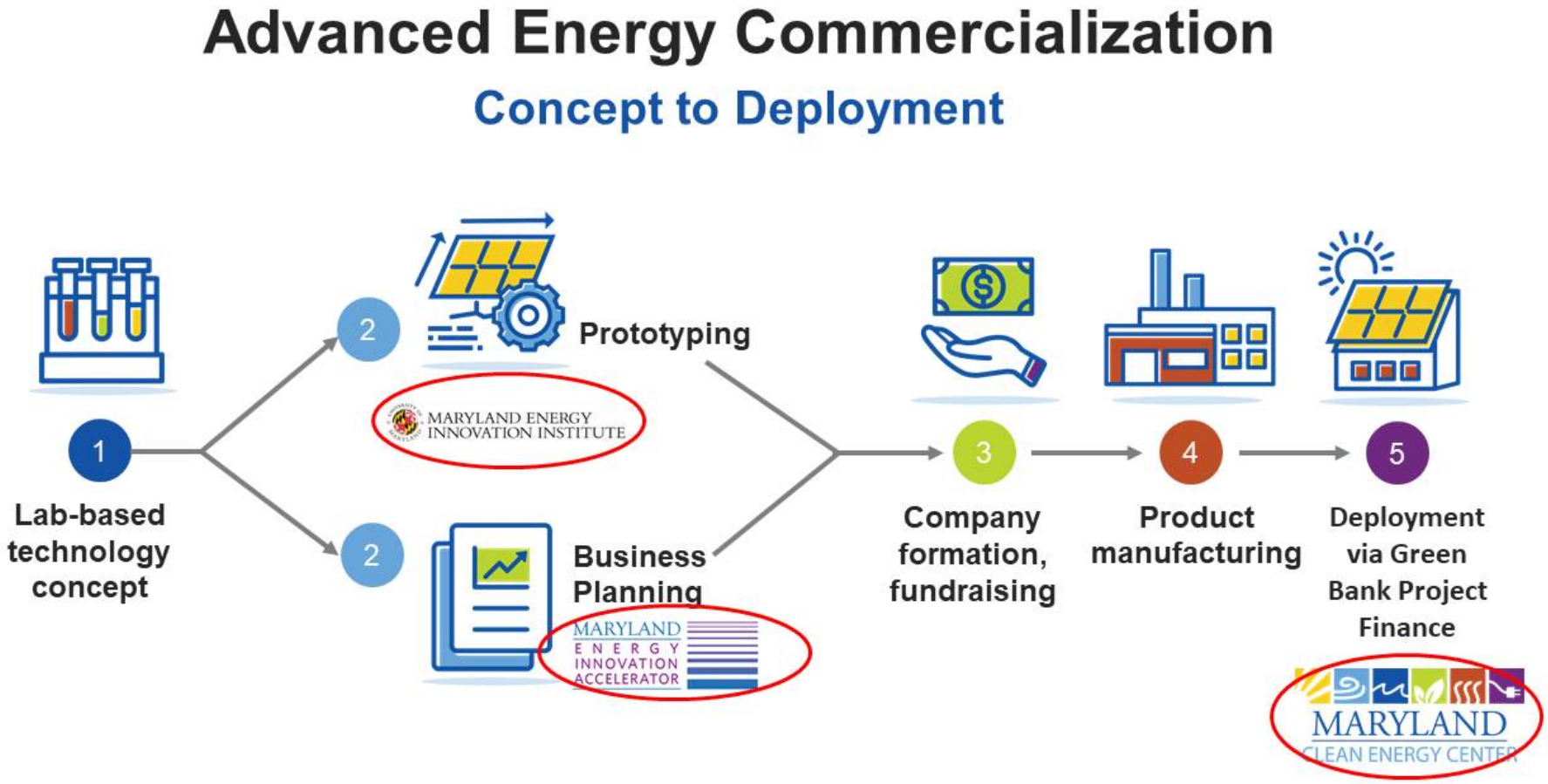
www.energy.umd.edu

Senate Finance Committee Testimony for HB419 / SB460



MEI² Energy Research

Maryland an academic powerhouse in energy research:

DOE BES Energy Frontier Research Center, $29M

Bi-National Center on Solid State Batteries, $18.4M

Transformational Army Batteries, $7.2M + $10M (FY21)

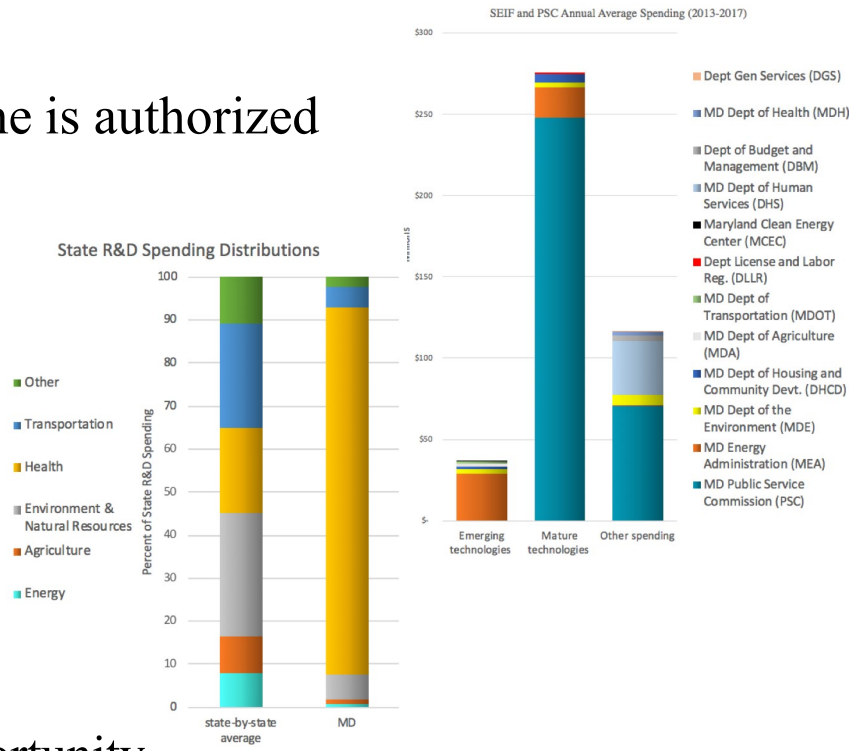
- UMD leads the nation in DOE ARPA-E Awards (*2nd only to MIT*), leading or participating in 28 awards for $64M in research funding since 2009 *ARPA-E is the only DOE agency focused on energy innovation and economic development*
- Since its creation in 2017 MEI² has helped obtain $55M in federal funding for the State of Maryland economy
- **MEI² has provided a 23X rate of return on Maryland's investment** based on its share of the SEIF ($2.4M to date)

Transforming MEI^2 Research to Innovation

MEI^2 legislation (HB410 / SB313) mandated report to Governor and General Assembly on development, deployment, and commercialization of clean energy technology from SEIF and other forms of financing and any need for additional funding for these purposes.

Report Findings include:

- With Maryland's energy research leadership and appropriate innovation infrastructure this could be major growth area for the Maryland economy.
- Maryland spends over $400M/yr on energy-related programs. However, none is authorized to support in-state development of clean energy firms.
- Maryland is last (#50) among all states in diversity of technology support for economic development
- Health-related R&D accounts for on average 85% of Maryland's total investment
- <u>There was no Maryland focused early stage energy investment in Maryland until MEI^2</u>



Report Recommendations include:

- Designate clean energy an economic development opportunity
- Expand seed funding and developmental support for clean energy innovation (**HB419 / SB460**)

Transforming MEI^2 Research to Innovation

MEI^2 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 company. Must have appropriate IP protection and commercialization plan.
- In first three years 14 seed grants were awarded to University of Maryland College Park (UMCP), University of Maryland Baltimore County (UMBC), University of Maryland Eastern Shore (UMES), Johns Hopkins University (JHU), and Morgan State University (MSU).
- Demand for these seed grants has grown rapidly far exceeding current budget to support.
- Several have resulted in follow on private investment.

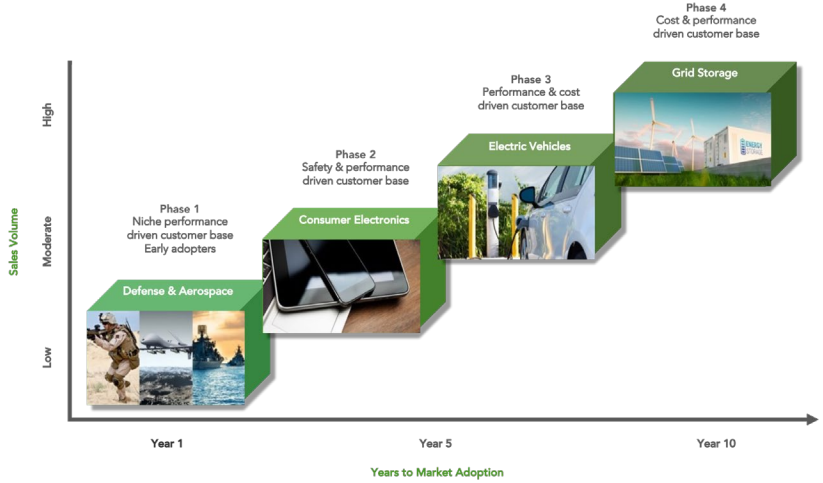
MEI^2 Investment Committee

Ellen Williams, *UMD Distinguished University Professor, Former Director ARPA-E (DOE)*
Julie Lenzer, Assoc.Vice-President for Economic Development, 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

Transforming MEI^2 Innovation to Jobs

ion Storage Systems

- Commercializing next generation batteries developed at UMD
- Over $20M in R&D funding
- $8M investment lead by Alsop Louie Partners
- 17 Employees and growing
- CEO, *former Exec Director Battery Operations - Apple*
- Moving into 20,000 ft^2 facility
- Scaling to 10 MWh/yr production
- Commercial prototypes available Q1 2021
- First product in defense market due to higher margin at lower volume
- Moving to higher volume markets as scale production
- Selected as "*Maryland Future 20*" company

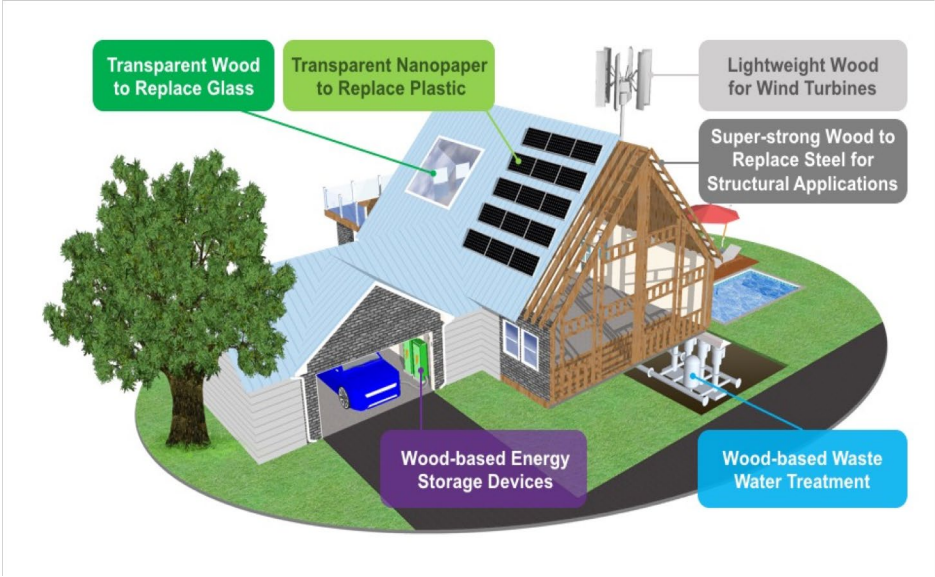


MARYLAND ENERGY INNOVATION INSTITUTE

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.

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:

Vehicles · Buildings & Houses · Aerospace · Furniture · Electronics

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:

Residential Insulation · Packaging · Furniture · Electronics · Musical Instructments

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:

Windows & Doors · Electronics · Glassware · Solar Panels · Vehicles

MARYLAND ENERGY INNOVATION INSTITUTE

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