POLICY BRIEF

MARYLAND CAN INVEST IN THE FUTURE BY EXPANDING ITS CLEAN ENERGY INNOVATION SYSTEM

Based on the findings, analysis, and recommendations from the legislatively mandated December 2019 report by the Maryland Energy Innovation Institute (MEI²) to the State of Maryland on the Present Status and Future Potential of Maryland's Clean Energy Innovation System, led by University of Maryland Department of Physics Distinguished University Professor Ellen D. Williams.

Clean energy is an opportunity for Maryland to "Invest for the Future." Worldwide, new investments in clean energy have exceeded $300 billion annually since 2014, with more than $50 billion annually in the United States alone. Maryland can develop its Clean Energy Innovation System to strategically bring in investment to the state, leverage local clean-technology innovations and firms, foster economic growth, and complement the state's strong social commitment to energy efficiency, clean energy and the environment.

Maryland's trend towards ambitious clean energy policy will result in major changes in the state's energy system over the next decade. For example, the bipartisan-backed Maryland Clean Energy Jobs Act puts our state on a path to 50 percent renewable electricity by 2030, signaling the start of a transition away from fossil fuels and towards clean energy technology. These changes will provide opportunities for economic growth in areas such as grid storage, grid optimization, power electronics, and new business models based on distributed clean power. The Maryland Energy Innovation Institute (MEI²) was created through a 2017 Legislative session Economic Development Act to advance Maryland's clean energy economy by integrating the world class energy research and innovation potential of its universities and focus on them with the clean energy financing and deployment activities of the Maryland Clean Energy Center (MCEC).

Majority of current spending on clean energy focuses on mature technologies with little emphasis on technologies of the future. Current spending of over $400 million / year primarily from the Public Service Commission and the Maryland Strategic Energy Investment Fund (SEIF) supports the deployment of mature technologies and some emerging technologies. Spending on clean energy technologies of the future that are developed in-state—currently at the proof of concept and prototype stages—is only about $2 million a year and is a small fraction of the overall energy spending.The low spending in clean energy reflects Maryland's lack of diversity in R&D spending. 85% of the state's R&D spending is on health-related technologies—ranking Maryland last among states in the diversity of its innovation funding. While investment in health-related technologies is important and plays to a key strength of the state, it limits potential growth in the state's economy and ignores a key opportunity for the state to increase energy efficiency, reduce harmful emissions, and improve public health and prosperity for its citizens.

Maryland has an opportunity to expand on its leadership in clean energy technology innovation. Maryland ranks among the top 10 states in the US for innovation capability overall. The capacity and ability to advance innovative technology is already present within the state. Despite the limited recognition of clean energy innovation as a state priority, there are over 150 active clean-energy firms in the state. From universities to think tanks to start-up companies, these assets include developing the alternative fuels, energy storage, bio-agricultural advances, and the replacement of energy-intensive materials that will propel the state and the world towards a clean energy future. Due to this grass-roots effort, Maryland ranks 10th in the country for the number of ARPA-E awards – awards that emphasize commercialization of early stage clean energy innovation. The state of Maryland has the tools, capacity, and forward-looking thinkers to become a leader in clean energy innovation and reap its economic and societal benefits, but needs to strategically invest in its capability.

To do this, there are several possible steps that can be taken. **Recommendations for the State of Maryland to advance leadership in clean energy:**

Recommendation 1: *Designate clean energy as an economic development opportunity*. The State of Maryland should diversify its strategic economic development priorities to include a Clean Energy Innovation System that supports innovation, development and in-state manufacturing of clean technologies.

Recommendation 2: *Broaden the definition of clean energy*. Future legislative language regarding Maryland's Clean Energy Innovation System should reinforce a broad definition of clean energy to ensure flexibility in supporting cutting-edge technologies that can meet the state's clean energy and greenhouse gas reduction goals.

Recommendation 3: *Improve coordination among state agencies working on clean energy*. The State should designate a responsible agency to provide coordination among the agencies that need to be involved in delivering the outcomes expected of the state's Clean Energy Innovation System.

Recommendation 4: *Provide developmental support for clean energy firms*. MEI² should be tasked state to provide developmental support for innovative clean energy firms through funding distributed on a competitive basis to Universities and other sites across the state.

Recommendation 5: *Expand seed funding and developmental support for clean energy innovation firms.* MEI² should be tasked and funded to establish a program of competitively awarded early-stage innovation funding and for clean energy firms at a level intermediate between Colorado and New York's per capita efforts.

Recommendation 6: *Establish metrics of success to judge progress*. The program to create a thriving Clean Energy Innovation System in Maryland should be managed in 5 year stages, and assessed against quantitative metrics of growth in firm number, federal and private sector funding per company, and rate of commercial maturation.

Funding Recommendation 1: *Create clean energy investment incentives*. The state should expand the remit (and names) of the present Investment Incentive Tax Credits, associated TEDCO Investment Funds, to include investments in clean energy technologies. DOC, TEDCO and MEI² should be jointly responsible for delivery of Maryland's Clean Energy Innovation System goals through these programs.

Funding Recommendation 2: *Increase financial support for clean energy innovation*. Provide new MEIF funding at the level of $4.5 million/year for an initial period of 5 years to support early-stage innovation. The funding may be provided by any combination of:

- Reallocation of the spending requirements for the SEIF to include a specific requirement to invest up to 10% of the funds in in-state clean energy innovation.
- New or reallocated support from the general fund, including the possibility of funding under the proposed CARES act.

The funding may be designated to:

- Provide seed funding and developmental support, $3 million/year to grow more and more productive firms focused on innovative clean energy products.
- Support deployment of clean energy technologies developed and produced in Maryland, $1.5 million/year.

Acronyms: Department of Commerce (DOC), Technology Development Corporation (TEDCO), Advanced Research Projects Agency-Energy (ARPA-E), Clean and Renewable Energy Standard (CARES), Maryland Energy Innovation Fund (MEIF), Strategic Energy Investment Fund (SEIF). ***Read the findings, analysis, and recommendations in the full report at go.umd.edu/MDenergy.***