MCEC Annual Report

Building the Advanced Energy Economy for Maryland

FY 2022

MARYLAND
CLEAN ENERGY CENTER

MESSAGE FROM THE CHAIRMAN

As Chairman of the Board, it is my privilege to introduce this Annual Report with a review of activity and accomplishments made by the Maryland Clean Energy Center during Fiscal Year 2022.

This has been a year of significant growth for the Center as we continue to adapt to life and business post-pandemic. Despite these challenges, MCEC celebrated the launch of the Clean Energy Advantage Loan Program and the expansion of eligibility measures for the MDPACE commercial lending program.

MCEC programs and financing activity were capitalized with $36.8 million in private investment. That brings the total leveraged capital generated by the Center to more than $158 million. MCEC deploys this capital to facilitate the adoption of advanced clean energy, energy efficiency, cleantech solutions, and to drive related business growth in Maryland.

Our work to champion advanced energy innovation continued to grow over the past year as well. Through successful efforts of the Maryland Energy Innovation Accelerator and our strong partnership with MEI^2, more advanced energy companies are coming to market from the labs of our state's exceptional universities.

Efforts to facilitate biomass energy adoption have expanded this year through MCEC management of the State Wood Energy Team, with future funding secured to continue this work in the coming year.

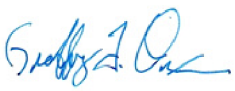
MCEC continued to deliver high quality educational content and resources at no cost to audiences through webinars and digital platforms, with the support of industry and government partners. Among the many topics addressed, MCEC continued to raise awareness of environmental justice through our outreach and education efforts, acting as a thought leader as we identify potential partners and solutions.

This year's report highlights the value of MCEC's work as we navigate challenges and unlock opportunities ahead in meeting our mission to advance clean energy and energy efficiency products, services, and technologies.

I want to thank my fellow board members, the hard-working staff, our forward-looking Advisory Council, and committed sponsors who make all MCEC's accomplishments happen. Likewise, we should all recognize what a tremendous asset we have in our partners throughout Maryland State agencies, particularly the Maryland Energy Administration, visionary elected officials throughout the state and the incredible minds hard at work in our universities. Together, we are building the next generation of energy and infrastructure to power Maryland into the future.

Thank you all!

Best regards,



Geoff Oxnam | Founder & CEO, American Microgrid Solutions

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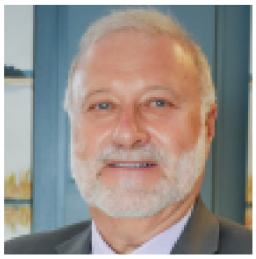
The **Maryland Clean Energy Center (MCEC)** was created as an instrumentality of state by the Maryland General Assembly in 2008. The Center serves as a statewide green bank with a mission to transform the energy economy in Maryland by increasing clean energy jobs, driving commercialization of technological innovations, and enabling consumer adoption of clean energy products and services. MCEC facilitates access to capital through leveraged or direct investment and operates financing programs targeted to serve various consumer audiences and underserved communities. The Center provides specialized procurement and technical support in order to facilitate and expedite project implementation.

Board of Directors

Geoff Oxnam
Board Chairman
Founder & CEO
American Microgrid Solutions

Mike Gill
Vice Chair of the Board
Portfolio Manager
Cornerstone Advisory

Andrea Pelletier
Treasurer of the Board
Senior Vice President of
Commercial Banking
Sandy Spring Bank



Al Delia
Board Member
Vice President for Regional
Development & Engagement

Brittney R. Powell, Esq.
Board Member
Attorney
Fox Rothschild LLP

John Quinn
Board Member
Director of Energy Policy
Baltimore Gas & Electric Company

Dr. Samuel I. Williams
Board Member
Professor of Government,
Business and Public Policy

Dr. Mary Beth Tung, Esq.
Ex-Officio Board Member
Director
Maryland Energy Administration

Dr. Eric D. Wachsman
Ex-Officio Board Member
Director, Maryland Energy Innovation Institute
William L. Crentz Centennial Chair
in Energy Research
Distinguished University Professor, University of
Maryland, College Park

COUNSEL

Roop Vijayan
Assistant Attorney General,
Office of the Attorney General
Department of Commerce

Dr. Alex Pavlak
Board Member (July 2018 - Jan 2022)
Chairman, Future Energy Initiative

Administrative Team

Katherine Magruder
Executive Director

Steven M. Cowan
Chief Investment Officer Chairman

Sabrina L. Bachman
Communications Director

Benjamin J. Rupert
Energy Project & Procurement Manager

Pamela R. Powers
Legislative Affairs & Administrative Manager

Dorothy Kolb*
Controller

Maura L. Ross
Wood Energy Coordinator

Brian Toll*
Director - Maryland Energy Innovation Accelerator

Ben Margolis*
Commercialization Program Manager - Maryland Energy Innovation Accelerator

Aziz Kamulegeya*
Clean Energy Advantage Loan Program Coordinator

* *Contractual Team Members*

MCEC INTERNS

Gail Carlson Communications Intern
University of Maryland College Park, c/o 2022

Victoria Fletcher Communications Intern
Morgan State University, c/o 2023

Colin Griffin Policy Intern
University of Maryland College Park, c/o 2022

Téa Lorsch Policy Intern
University of Maryland College Park, c/o 2022

Monique Mann Communications & Marketing Intern
University of Maryland College Park, c/o 2022

Evan Yagel Corporate Finance Intern
University of Maryland, c/o 2022

EXECUTIVE SUMMARY

Legislative Highlights & Impacts for MCEC Operations

This fiscal year marked a significant step for MCEC, with the veto override of Senate Bill 460 & House Bill 419: Economic Development – Advanced Clean Energy and Clean Energy Innovation Investments & Initiatives.

The legislation included language which would:

- **broaden the definition of clean energy** to include advanced energy and grid modernization technologies;
- **clarify the capability of MCEC to serve as a state Green Bank** and to finance energy measures on state facilities; and
- **ensure a predictable, consistent annual appropriation of $2.1M** to support the energy technology research and development activities of the Maryland Energy Innovation Institute as well as the work of the Maryland Clean Energy Center and the Maryland Energy Innovation Accelerator.

Other key legislative changes to MCEC operations include:

- **Passage of landmark Climate Solutions Now Act**, positioning the state as a nation leader in adopting aggressive greenhouse gas reduction goals, and creation of the Climate Catalytic Capital (C3) Fund with passage of SB528, include a three year commitment of $5M per year in leveraging capital.
- **Passage of the Maryland State Agency Transparency Act of 2022** modifying the Open Meetings Act – Application and Enhanced Requirements (mandating MCEC among other state entities to practice compliance beginning October 2022. MCEC will now broadcast meetings and publish meeting recordings online.

STAR Commission Task Force Report Summary

Governor Larry Hogan's State Transparency and Accountability Reform (STAR) Commission was established under Executive Order 01.01.2020.05, in December 2020 to review the operations and structures of state instrumentalities that operate as quasi-governmental agencies (QGA), including MCEC.

The Center participated in the questionnaire and interview process to provide the STAR Commission with the necessary research needed to produce a final report, which outlines findings and recommendations to ensure that QGA operations are held to set standards for quality and transparency.

Energy Sector Jobs & Wages as an Indicator Industry Health

Total sector employment increased from 138,020 jobs to 140,275 jobs, in 2021, following a decrease in the prior reporting period.*

** The 2022 MCEC Employment and Wages Report is derived from the most recently available (4th quarter of 2021) Bureau of Labor Statistics' (BLS) Quarterly Census of Employment and Wages (QCEW). The source for the prior years' data came from the 4th quarter (December) of each year (2017 – 2021).*
Note: BLS data is typically not available for up to 6 months after it actually occurred.

Compared to 2020, total sector-wide employment increased by 1,995 jobs, while total sector annual earnings also increased by a collective $264,651,388. The decline in 2020 can likely be partially attributed to the COVID-19 pandemic's economic impacts.

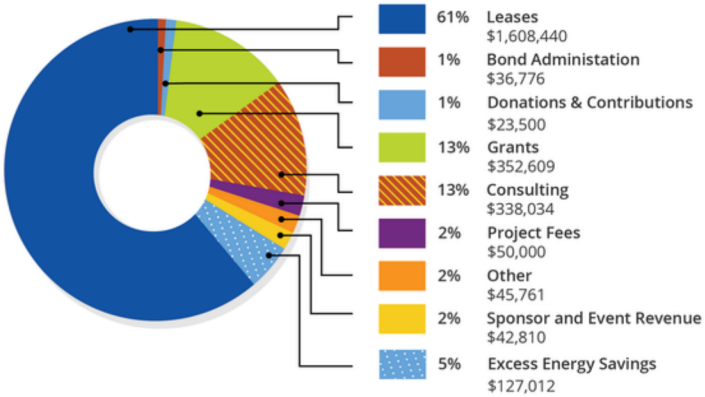
The 2022 MCEC Comparison Report shows that the collective annual earnings of all workers in the clean energy sector increased from $11,088,433,368 in 2017 to $12,568422,708 in 2021.

MCEC OPERATIONAL OVERVIEW

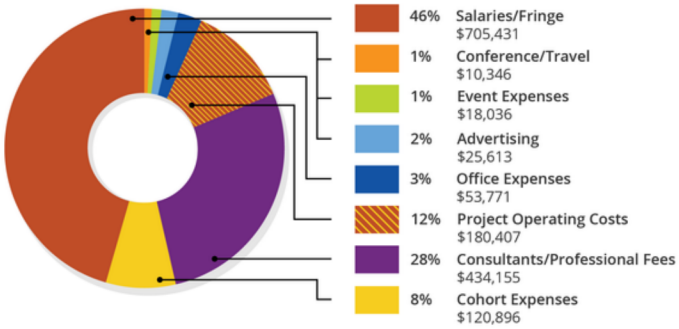
Funding Support and Budget

The Maryland Clean Energy Center budgeted for revenue of $1,983,269 and expenses of $1,893,892 for FY 2022. Sources of revenue for the period included: grants, excess energy savings revenue, project fees, sponsor and event revenue, bond administration revenue, and miscellaneous earned interest income. Total revenue at fiscal year-end was $2,624,942 with a net operating income of $229,646.

FY 2022 MCEC Revenue



FY 2022 MCEC Expenses



In FY 2022, MCEC incurred a total of $2,395,296 in operating expenses, with funds invested to support general administration, board activities, along with operation of the Maryland Clean Energy Capital (MCAP) Maryland Property Assessed Clean Energy (MDPACE) programs, and a new Clean Energy Advantage (CEA) Pilot Loan Program. There funds were also invested to support outreach and education activity.

At the close of FY 2022, MCEC staff included six full-time positions, including one grant-funded to support the Biomass Energy Initiative: State Wood Energy Team Grant. There were also three part-time contractual positions, one to support each of the following areas: accounting and legal services, program management for the Maryland Energy Innovation Accelerator (MEIA), and program management for CEA.

FISCAL REPORT - "Management's Discussion and Analysis and Financial Statements Together with Independent Auditors' Report" can be found online at www.mdcleanenergy.org/about-mcec/enabling-statute/financial-statements.

2022 Advisory Council

The Maryland Clean Energy Center is required by statute to appoint an Advisory Council to help develop a work plan for MCEC, set the framework for activity of the organization, advise the Executive Director, and inform the Board of Directors.

The Council evaluates issues, reviews proposed policy and regulatory matters, facilitates relationship building, and builds awareness of MCEC to encourage the adoption of its mission. In addition, the group identifies and works to remove barriers to success in the energy sector.

2022 Advisory Council Members

Walt Alfred
CEO - Ally Power Inc.

Eric Alini
Managing Partner - CounterpointeSRE-
Hannon Armstrong Sustainable Real Estate

Michael Billingsley
Senior Director, Originations - Nuveen Green Capital

Brandon Bowser
Energy Resilience Program Manager -
Maryland Energy Administration

Daniel Bresette
Executive Director -
Environmental and Energy Study Institute

Kevin Brown
Partner - True Search Partners

Michael Bryant
President - Sabot Ventures LLC

Paul Clary
Co-Founder - MD Energy Advisors

Jessa Coleman
Assoc. Director of Policy and Programs - Nuveen

Musa Collidge-Asad
Chief Investment Officer - Inclusive Prosperity Capital

Michael Eckhart
Visiting Clinical Professor - University of Maryland

William Ellis
Region Vice President, Government Affairs -
Pepco, An Exelon Company

Henry Fawell
Founder - Campfire Communications

William Fields
Deputy People's Counsel - Office of People's Counsel

Armando Gaetaniello
VP of Business Development - Neighborhood Sun

Josh Garrett
Director, Structured Investments - Hannon Armstrong

Robert Gorsuch
Manager - ESMEC Energy Trust

Charles Hernick
Vice President of Policy and Advocacy -
Citizens for Responsible Energy Solutions Forum

Jeffrey Hood
Chief Executive Officer -
Hood Engineering and Consulting Services, LLC

Todd House
Manager, Economic Development - Washington Gas

Joanne Ivancic
Executive Director - Advanced Biofuels USA

Frederick Johnson
Park Manager - MNCPPC Department of Parks & Rec

James Johnson
Director of IBBR Facilities & Lab Services - UMD IBBR

Stephanie Johnson
Executive Director - CHESSA

Len Jornlin
President & CEO - Optimize Renewables

Pari Kasotia
Consultant - Coalition for Green Capital

Andrew Kays
Executive Director -
Northeast Maryland Waste Disposal Authority

George Kervitsky, Jr.
President -
Kervitsky Energy & Environmental Consulting

Rick Kilbourne
Senior Origination, Renewable Development -
Brookfield Renewable Energy

John Kotek
Sr. VP, Policy & Public Affairs - Nuclear Energy Institute

Adam Landsman
President - PulseIQ!, LLC

Troy LeMaile-Stovall
CEO - TEDCO

Michael Li
Principal - ILLUME Advising

Kevin Lucas
Sr. Director of Utility Regulation and Policy - SEIA

Arjun Makhijani
President - Institute for Energy and Environmental
Research (IEER)

Jim McDonnell
COO - Avalon Energy Services, LLC

Claudia Meer
CEO - CoreMax Consulting

Michele Mitch-Peterson
Energy Business Consultant - Siemens

Shannon Moore
Director, Sustainability and Environmental Resources -
Frederick County Government

Nandini Mouli
President/Founder - eSai LLC

Kobby Osei-Kusi
CEO - Pirl Technology, Inc.

Kwabena Osei-Sarpong
President & CEO - RIFE International

Alex Pavlak
Chairman - Future Energy Initiative

Christopher Peoples
Managing Partner - Peoples Partners and Associates

Sabine Rogers
Senior Policy Associate - AnnDyl Policy Group

Benjamin Roush
Principal - FSi Engineers

Cherise Seals
Senior Account Executive - NORESCO

Joseph Seehusen
Director, WholeHome, Energy & Business Lending -
MD Dept. of Housing & Community Development

Alison Shea
Vice President of Sales - Limbach

Grant Shmelzer
Executive Director - IEC Chesapeake

Thomas Simchak
Energy Consultant - Taucher International

Andre Slonopas
Energy Engineer - US Army Futures Command

Brooke Smallwood
Associate Vice President - CARIAN

Todd Stave
CEO - Blue Bear Management

Mark Stewart
Climate Change Program Manager -
Maryland Dept. of the Environment

Bill Temmink
Organizer - Carbon Free by 2040

Paul Thompson
Business Dev. Officer - Twain Financial Partners

Nicola Tran
Senior Energy Program Manager -
MD Dept. of Housing & Community Development

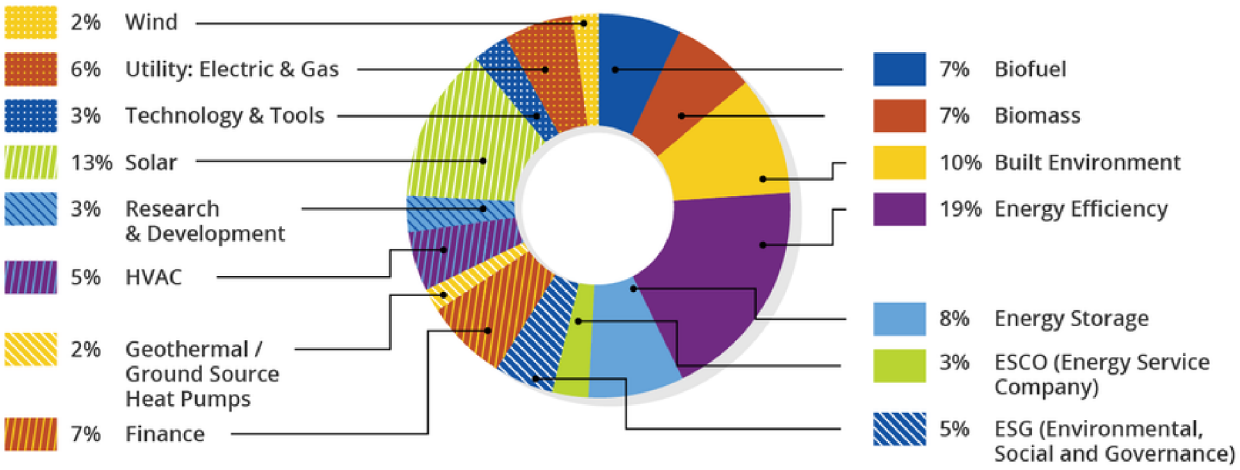
Barbara Tyran
Director, Macro Grid Initiative - ACORE

Stu Widom
Manager, Regulatory & Legislative Affairs - PJM
Interconnection, LLC

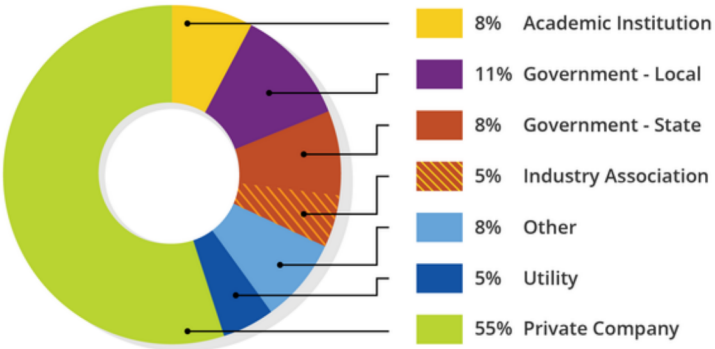
David Wilson
Estimator - Chesapeake Contracting Group

Diana Younts
Co-Chair - MLC Climate Justice Wing

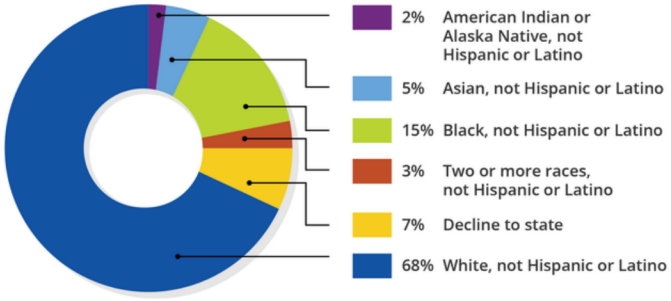
Advisory Council Member Industry Sector Representation



Advisory Council Members' Company / Organization Type



Advisory Council Members' Self-Reported Race / Ethnicity



MCEC resumed an in-person annual meeting for the Advisory Council, which hosted 35 members, plus MCEC staff and special guests.

The roundtable discussions provided supporting details for the data received from the Market Assessment Survey, which received 40 responses- a 12% decrease for the number of respondents in 2021.

Market Analysis

MCEC conducted an Advanced Energy Market Assessment Survey in the spring of 2022, in order to assess the needs of the energy industry and better understand what resources, investments, policies, and partnerships the instrumentality may work to provide in the coming years.

The summary report of compiled survey results was shared with MCEC's Advisory Council ahead of their annual meeting to guide workgroup discussions and prioritize focus areas for the Center's work.

Based on compiled feedback, the following areas are recommended as priority focus areas for MCEC efforts:

1) More consumer outreach and education is needed.

- Stakeholders want market development support to reduce barriers to technology adoption
- Content tailored for target audiences including LMI and Municipal/ K-12 Schools
- Highlight local companies working in clean energy, and specifically the EV charging infrastructure space

2) Policy is a major consideration and stakeholder value MCEC's Policy Watch activities.

3) Workforce availability and capability is a concern that MCEC could help address.

4) There is a need for MCEC to facilitate connections between government and nongovernment entities.

5) Engage Carbon Capture Sector, enable innovation in this space, and look into ways to use credits in financing projects.

Stakeholders identified the following MCEC offerings as having the highest value (ranked):

Outreach & Education

Policy Information

B2B Networking Opportunities

Access to Capital & Finance

Procurement & Tech Support

Innovation Support

View the Advanced Energy Market Assessment 2022 Summary Report at www.mdcleanenergy.org/resources/mcec-reports.

FINANCE

Mobilizing Capital, Providing Procurement & Technical Support

MCEC works with both public and private project development partners to provide advantageous financing, using its authority to issue tax-exempt and taxable bonds with the potential to own, operate, and lease assets. The Center also offers fee-for- service technical and procurement support to its core competencies to expedite the evolution of energy projects from concept to completion.

During FY 2022, MCEC programs and financing activity were capitalized with over $36M in private investment.

MCEC currently operates the Maryland Clean Energy Capital (MCAP) and Maryland Property Assessed Clean Energy (MDPACE) programs, along with the Clean Energy Advantage (CEA) loan program, launched in late March 2022, to provide residential consumers with affordable, fixed rate financing for home energy efficiency improvements.

Total overall amount of leveraged capital generated by MCEC through FY 2022: $158,504,963

FY 2022 Finance Division Goals:

- Facilitate access to capital for clean energy project and business development
- Generate fee income for MCEC
- Enable job creation and achievement of climate goals

Key Finance Division Objectives:

- Establish MCEC as the go to independent resource for energy project development technical and financial assistance
- Generate sufficient fee revenue to offset costs of providing services
- Expedite vision to implementation pathway for projects to create jobs and achieve climate mitigation goals
- Add capacity to government operations in a cost-effective manner

Finance Program Impact Metrics

	FY 2022 TOTALS	CUMULATIVE TOTALS
Evaluate Annually and Maintain Running Total		*As of June 30, 2022*
Leveraged Investment (public to private $$)	$36,794,311	$158,504,963
Fee Income Generated		
Fee-for-Service	$51,454	$108,676
Financing	$50,000	$105,990
Project Finance Pipeline Projects	10	12
Project Finance Deals Closed	1	1
Project Management Pipeline Projects	0	1
Project Procurement, Technical Support & Management MOUs	2	4
Energy-related Outcomes of Projects		
kWh Saved	18,533,980	107,533,980
kWh Cost Savings	$1,675,905	$8,168,309
kWh Renewable Generation	0	0
kWh Storage Capacity	0	0
BTU Therms Saved	176,963	1,105,973
BTU Cost Savings	$71,968	$555,592
Therms Generated	0	0
Industry Job Hours (CEA, MDPACE & MCAP)	535,268	2,847,876
Climate Impact (greenhouse gas reduction, carbon capture)		
Greenhouse Gas Reduction (Tons-NOx, SOx & Methane)	0	0
CO2 Avoided (MT)	1,534	6,468
Water / Sewer Conservation	28,106	179,944
Water / Sewer Conservation Cost Savings	$149,157	$1,016,015

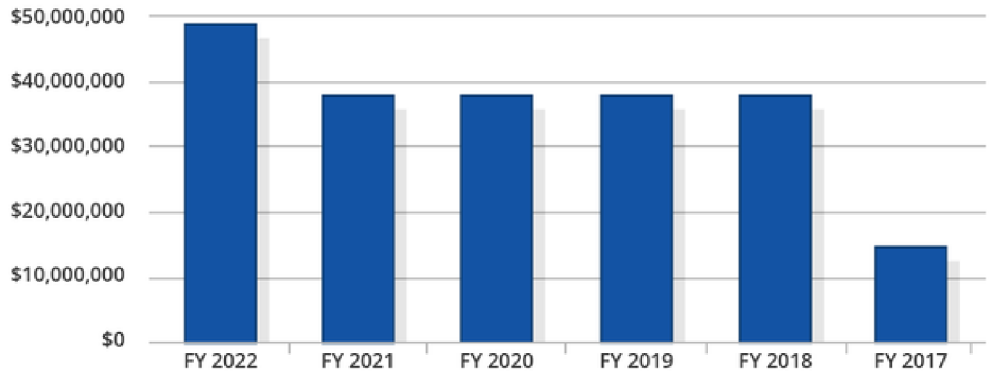
**Number does not include Industry Job Hours for UMBC MCAP project.*

Maryland Clean Energy Capital Program

The Maryland Clean Energy Capital Program (MCAP) provides access to private capital through the issuance of tax-exempt and taxable bonds. As a public instrumentality of the State of Maryland, MCEC is authorized by its enabling statue to be an issuer of tax-exempt debt for projects that support the advancement of clean energy, economic development, energy innovation, and related jobs creation in the State.

Since MCEC's inception, bond proceeds and additional sources of capital have been used to fund over $165M in energy efficiency capital projects.

MCEC Cumulative Bond Issuance



Cumulative MCAP bond issuance through the period ending June 30, 2022, totaled $46.5M for tax-exempt bonds and $5.1M for taxable bonds.

Proceeds from the six bonds and notes issued through MCAP funded energy efficiency, mechanical equipment upgrades, and renewable energy production including capital improvements for lighting, HVAC, solar hot water heaters, boilers, chillers, building envelope renovations, water conservation measures, combined heat and power systems, demand response systems, construction management, capitalized interest, and cost of issuance.

Two large-scale energy efficiency projects, funded in part with proceeds from MCEC bond issuances, were still under construction during FY 2022.

MCEC closed a $10.3M Energy Performance Contract to move Morgan State University (MSU) towards master plan sustainability goals.

Through a partnership with MCEC, MSU closed a $10,343,339 tax-exempt Energy Performance Contract (EPC) debt financing. The financing enables MSU to achieve related climate goals and was structured and arranged by MCEC through a Shared Energy Savings Agreement which is secured by guaranteed energy savings.

The energy savings measures to be implemented under the EPC project will be executed through partnerships among MSU, MCEC, and Siemens with measures to significantly reduce energy consumption, increase operational efficiency, and address deferred maintenance projects for several key facilities at MSU, including the central heating plant and Hughes Stadium.

MARYLAND CLEAN ENERGY CAPITAL
providing financial solutions

Affordable Energy Project Financing Case Study

Morgan State University

As part of a comprehensive campus-wide master energy and sustainability plan, MSU completed an Energy Performance Contract debt financing to fund the installation of energy efficiency equipment around the University.

The energy savings measures are being implemented through agreements among MSU, MCEC and Siemens Industry, and will significantly reduce energy consumption, increase operational efficiency, and address selected deferred maintenance projects.

The MCAP Shared Energy Savings transaction model was used to facilitate third-party ownership of the project by MCEC and attract cost effective tax-exempt capital, supported by an Energy Performance Contract where the ESCO guarantees the energy, operation, and maintenance savings.

Photo courtesy of Morgan State University

Loan Amount	$10,343,339
Loan Term	15 Years
Interest Rate	2.8898 %
Avg Annual Savings (Energy, O&M)	$268,126
Avg Annual Debt Service	$903,564
Lender	Siemens Financial Services
ESCO	Siemens Industry, Inc.

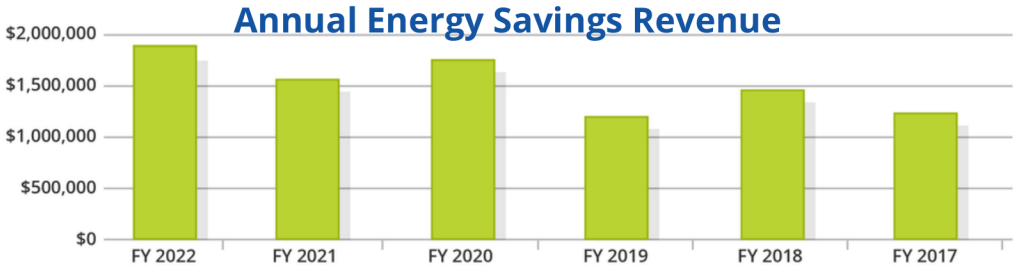
Energy Conservation Measures

- Interior, Exterior and Stadium Lighting
- Demand Flow
- Water Conservation Fixtures
- Duct Cleaning and Sealing
- Steam Trap Replacement
- Boiler Upgrades
- Steam and Condensate Pipe Insulation

MARYLAND CLEAN ENERGY CENTER

Procurement & Technical Support Services

MCEC offers neutral third party technical and financing capability to help partners implement energy measures efficiently, and has the capacity to facilitate procurement as a service by assisting with project design, development, and financing to move institutions more quickly through the process.



During FY22, MCEC managed Procurement &Technical Support services through MOUs with Morgan State University and Baltimore City. The center executed a similar intergovernmental agreement with Baltimore County to assist with increasing the County's ability to evaluate, prioritize, and meet energy and sustainability goals.

This five-year agreement outlines the following areas for MCEC to offer assistance to Baltimore County:

- Evaluation, development, implementation, and/or financing of energy projects and programs
- RFP development
- Proposal evaluation for clean energy and EPC projects
- Siting and location of renewable energy technologies
- Procurement strategy and process

The County has also requested that MCEC provide expertise in order to develop, and potentially implement, certain energy related initiatives and tasks put forth in their Executive Orders 2021-005, "Leadership In Energy and Environmental Design," and 2021-012, "Forging a Strong Renewable Energy Policy."

Through FY 2022, Fee-for-Service Revenue has totaled $108,676 for MCEC.

Maryland Property Assessed Clean Energy Commercial Lending Program

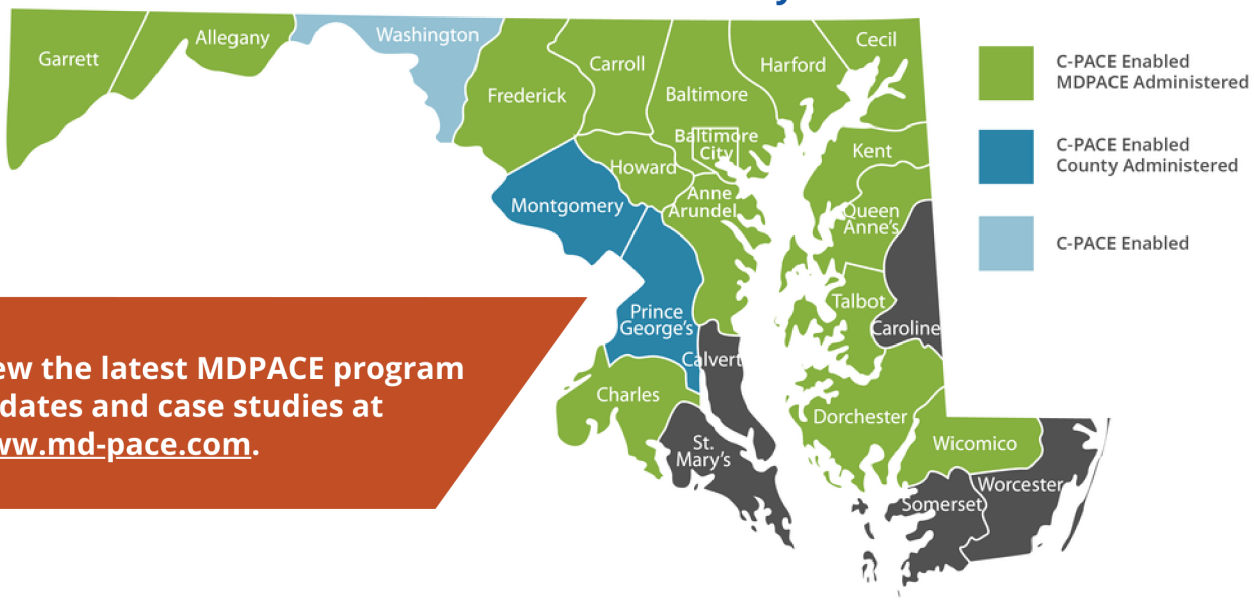
The Maryland Commercial PACE (MDPACE) program expanded its program guidelines to include resiliency, environmental remediation, and indoor air and water quality as qualifying measures for C-PACE financing, following the passing of House Bill 517: Clean Energy Loan Program - Remediation and Resiliency. In addition, the program will expand to allow refinancing of recently completed C-PACE eligible projects across the state. The program offers access to affordable, 100% up-front capital to assist retail, commercial, industrial, agricultural, and not-for-profit property owners.

MCEC oversees MDPACE, and the program transitioned to a new program administrator, Abacus Property Solutions, in FY 2022.

The program underwent a rebrand, and outreach occurred to introduce the new Program Administration team to local jurisdiction program contacts. Updated program guidelines will be distributed and a new website launched before the end of the calendar year.

During FY 2022, $25,558,711 in MDPACE transactions closed in the state, bringing the **cumulative total of MDPACE transactions above $76M**, and the C-PACE transaction total for the state over $86M.

Where is C-PACE in Maryland?

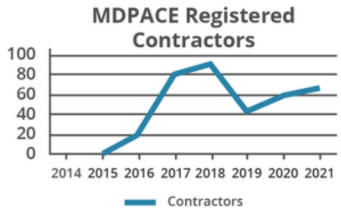


View the latest MDPACE program updates and case studies at www.md-pace.com.

With the addition of Washington County, nineteen major jurisdictions in Maryland have passed C-PACE enabling ordinances, and Somerset County is pending. Montgomery and Prince George's Counties enabled C-PACE programs are self-administered performance contract financing.

MDPACE Program Participation Overview

57 (-1)



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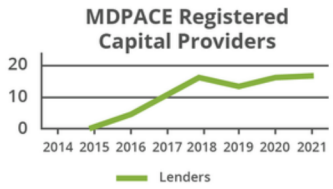


In an effort to support C-PACE efforts across the region, MCEC continues to offer administrative support for the Mid-Atlantic PACE Alliance (MAPA) initiative, previously supported by the US Department of Energy.

Clean Energy Advantage Residential Loan Program

The Clean Energy Advantage Pilot Loan Program is a lending initiative sponsored by the Maryland Public Service Commission, to provide affordable financing for energy efficiency home improvements to all Maryland residents, regardless of income. The program is administered, in partnership, by the Maryland Clean Energy Center and the Montgomery County Green Bank.

The Clean Energy Advantage (CEA) Loan Program provides affordable financing for home energy efficient heating and air conditioning systems, water heating systems, windows and doors, whole home insulation, and weatherproofing, regardless of income level.

Residents within Maryland service territories for BGE, SMECO, Potomac Edison, Delmarva Power, Pepco, and Washington Gas are eligible for this program, which is paired with utility Home Performance with ENERGY STAR (HPwES) / Home Energy Improvement Program (HEIP) or HVAC rebate program.

Program Highlights

- Pay no interest for the first 12 months
- Pre-approvals usually issued within 3 business days
- Loans combined with utility rebates; can include other state & federal incentives
- Fixed interest rates for the entirety of the loan term
- Choose from 3, 5 or 10 year loan terms
- Loan amounts from $3,000 to $35,000

Timeline of CEA Loan Program Milestone Accomplishments

PSC Approval - June 2021 MCEC and MCGB received approval from the Maryland Public Service Commission (PSC) to develop and implement a new residential financing program.

Lender Acquired - July 2021 MCEC signed a loan loss reserve agreement with Clean Energy Credit Union thereby securing a lender to participate in the CEA Loan Program.

Program Administrator Engaged - October 2021 MCEC signed a procurement contract with InClime, Inc, an Annapolis-based small business that specializes in technically enabled incentive programs for public entities, providing strategic technical and program management for the CEA Loan Program.

MOU with Utility Partners Executed - November 2021 A memorandum of understanding to provide the framework for operations was executed by MCEC, MCGB, and the EmPOWER Maryland participating utilities: Southern Maryland Electric Cooperative, Inc. (SMECO), Potomac Edison Company, Potomac Electric Power Company (Pepco), Baltimore Gas and Electric Company (BGE), Delmarva Power & Light Company, and Washington Gas Light Company.

Program Launch - March 21, 2022 The program website, cealoan.org, went live with the activated loan application portal. The site logged 6,080 visits through FY 2022, following launch.

DC Green Bank Joins Regional Partnership - June 15, 2022 Through a partnership agreement between MCEC and the DC Green Bank, homeowners in Washington, DC will be able to access affordable lending capital for energy improvements on their residences.

First Loans Funded - June 2022 At the close of FY 2022, the CEA Loan Program had accepted 26 loan applications, with potential project implementation valued at $242,197 in improvements. Nine of the projects were located in Montgomery County service territory and 17 throughout the rest of Maryland. Of those 26 applications, 2 had completed improvements and loans were dispersed, and 5 were in progress to complete the contracted work. The remaining 19 were in the underwriting process. So far, work completed through the program has generated 24 FTE contractor job hours.

Biomass Energy Initiative - State Wood Energy Team Grant

The goals for the USDA Wood Innovations Grant (FY 2021) are to hire a Wood Energy Coordinator (WEC) through the Maryland Clean Energy Center (MCEC), reform the policy-focused Wood Energy Coalition into a project-oriented State Wood Energy Team (SWE Team), prioritize the state's facilities on potential to switch to wood energy, and promote wood energy throughout communities.

In June of 2021, the Maryland Department of Natural Resources (DNR) Maryland Forest Service was awarded $249,869 for a Wood Innovations Grant from the U.S. Department of Agriculture (USDA) to develop priority projects with the Maryland Wood Energy Team. This partnership effort between the Maryland Clean Energy Center, Maryland Department of Commerce, University of Maryland Extension, the USDA Forest Service, and others aims to develop wood energy facilities that will produce new jobs and develop renewable energy markets for underutilized forest products, which will in turn benefit the health of Maryland's sustainable forests.

While the Maryland Department of Natural Resources (DNR) has pursued wood energy systems, there have always been roadblocks– the target facility did not have the funds, it took too long so the facility lost interest, or it was simply not the right time. Having a dedicated staff person, the Wood Energy Coordinator, was seen as an instrumental factor in reaching out to potential facilities, providing continuous follow-up, and connecting them to resources that will help reduce barriers to switching from fossil fuels to wood energy.

The 7 major objectives outlined in relation to the grant are:

1. **Contract with the Maryland Clean Energy Center to staff a Wood Energy Coordinator** position for 2 years.
2. **Communicate the benefits of thermal wood energy** to corporations, institutions, and agencies.
3. **Add wood as a standard renewable energy** (alongside wind, solar, and geothermal).
4. **Priority rank 50+ facilities for potential conversion to wood energy.** Rankings based on facility qualities as well as economic and environmental justice impacts within the community.
5. **Provide 5-10 facilities with USFS WERC engineering and analysis services and conduct 5-10 IMPLAN analyses** to explain community impacts for each project.
6. **Conduct outreach to the communities of potential projects** about benefits of wood energy.
7. **Convene the MD Wood Energy Team** for 9+ meetings to plan and coordinate activities.

Considerable progress was made in FY 2022 toward those grant objective deliverables. Maura Ross was hired as the Wood Energy Coordinator in mid-September. Communities were prioritized by logistic, environmental, and financial means impacting their likelihood to switch to wood energy. The State Wood Energy Team leadership shifted from the University of Maryland Extension to the Wood Energy Coordinator and now focuses on implementing physical wood energy projects across the state, as well as advocating for wood energy-friendly policy. Numerous facility owners, environmentalists, and government leaders have been engaged to build awareness for the potential benefits of wood energy within the state of Maryland.

At the end of the fiscal year, Letters of Intent were accepted by the Maryland Agricultural Education and Rural Development Assistance Fund (MAERDAF) for two grants, administered by the Rural Maryland Council in partnership with MCEC to continue this work.

The first grant proposal is to accomplish comprehensive fuelwood supply analysis to obtain a county-by-county breakdown of the amount, location, and types of waste wood feedstocks are available for use in energy applications.

The second grant proposal is to offer educational tours to help connect wood energy, forestry, and natural resource experts with policy makers and environmentalists to demonstrate implementations of related technology at locations that have benefited from wood energy and/or the wood energy process. The proposal outlines two options for these tours: 1) three in-state tours and three out-of-state tours to New England, or
2) three in-state tours and one tour to Austria- the world leader in wood energy.

An example of wood energy is the Spring Valley Bruderhof Community's combined-heat-and-power system. They receive their wood for free from loggers looking for a place to dump their "fuel-grade" wood, or wood from forest management practices, and wood from local carpenters and construction companies that is not high enough quality for their work. They chip the wood on-site and have an automatic system that feeds the chips into the boiler, making it a hands-off process.

INNOVATION ADVANCEMENT

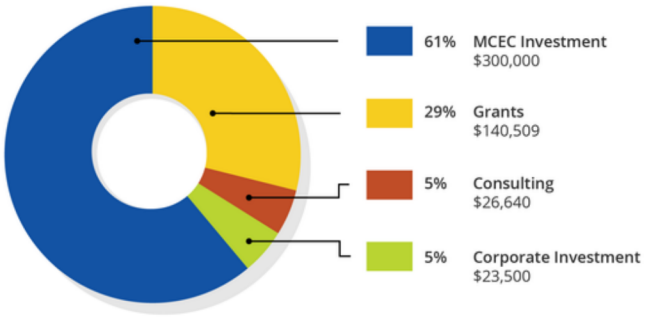
Creating Advanced Energy & Climate Technology Startups

MARYLAND ENERGY INNOVATION ACCELERATOR

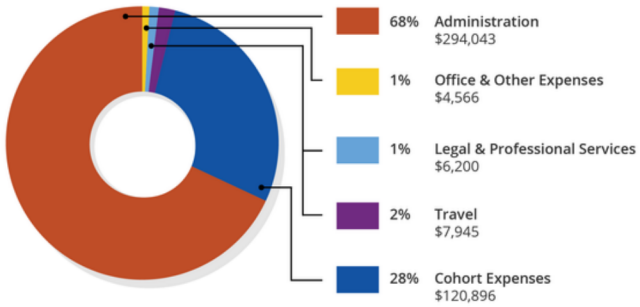
The Maryland Energy Innovation Accelerator (MEIA) is the venture development and advancement program offered by MCEC, focused on commercializing advanced energy and climate technologies developed at Maryland-based businesses, universities, and federal laboratories.

MEIA uniquely blends the "pull" of an early-stage venture development program with the "push" of accelerating existing pre-revenue businesses to create investible companies that will become the foundation of Maryland's newest economic cluster. MEIA provides Startups with access to domain experts, strategic partners, professional services, and project management support to execute commercialization milestones.

FY 2022 MEIA Revenue



FY 2022 MEIA Expenses



FY 2022 Innovation Advancement Goals:

- Facilitate translation of clean tech discoveries to marketable products and services
- Promote business and job creation in the clean tech sector for Maryland
- Develop clean tech ecosystem in Maryland

Key Innovation Advancement Objectives:

- Identify promising technologies developed in Maryland
- Pull licensable technologies from Universities and Federal Labs into high quality startups
- Accelerate commercial maturity of small startups' bus
- Provide technical assistance with the development of commercialization plans
- Generate sponsorship and tech to market income to offset costs to operate MEIA above the State of Maryland contribution

Innovation Impact Metrics

	FY 2022 TOTALS	FY 2021 TOTALS	FY 2020 TOTALS	CUMULATIVE TOTALS
Number of Companies Formed	6	0	1	7
Number of Companies Served	17	22	5	44
Number of Full-time Jobs Created	7	8	0	15
Number of Part-time Jobs Created	3	2	0	5
Third Party Capital Investment	$1,800,000.00	$3,200,000.00	-	$5,000,000.00
Grant and Sponsorship Revenue for Teams	$2,325,000.00	$656,000.00	-	$2,981,000.00
MEIA Tech to Market Fee Income	$26,639.30	$65,000.00	$25,000	$116,639.30
MEIA Grant and Sponsorship Revenue	$164,008.82	$277,000.00	$255,000	$696,008.82

In September, **MCEC was awarded a three-year grant totaling $750,000 from the U.S. Economic Development Administration (EDA) to support the Maryland Energy Innovation Accelerator**. The award is part of EDA's 2021 Build to Scale Venture Challenge, which seeks to leverage regional competitive strengths to accelerate innovation and job creation through high-growth technology entrepreneurship and fostering inclusive access to proven entrepreneurship support models.

The program also received local foundation support through a $10,000 award from the Butz Foundation.

MEIA launched its first cohort in January 2020,and in its first 30 months worked with (and continues to work with) 44 Startups that generated significant incremental economic development impact to the State of Maryland after enrolling in a MEIA program.

MEIA provides three programs that represent a three-tiered approach that moves technology from concept to demonstration:

1) Pre-Accelerator – A two-month customer-discovery program for the earliest technologies from universities and labs;

2) Launchpad – A six-month commercialization planning program for high-potential technologies in universities or labs; and

3) Accelerator – A six+ month program for established companies looking to fill senior roles, to demonstrate technology, and to obtain third-party capital investment.

FY 2022 Launchpad and Accelerator Teams

LEARN MORE ABOUT THE TEAMS AT WWW.MDEIA.ORG/PARTICIPATING-STARTUPS

TEAM NAME	TECHNOLOGY	ENTRY DATE	AFFILIATION	STATUS
CUPTech	Upcycling of plastics	Spring 2021	JHU	Graduated from Launchpad
InventWood	Wood replacement for steel	Spring 2021	UMD	Graduated from Accelerator
ATP-MD	Biomass to value	Summer 2021	None	Graduated from Accelerator
Dynami Battery	Battery printing technology	Summer 2021	None	Graduated from Accelerator
Rechargeable Zinc Battery (RZB)	Zinc battery for wearable applications	Summer 2021	UMBC	Graduated from Launchpad
EDAC Labs	Direct air capture of carbon dioxide	Fall 2021	JHU	Graduated and Incorporated
Living Canopies	Ecofriendly bus shelters	Spring 2022	UMD	Accelerator participant
HighT-Tech	Catalyst manufacturing	Spring 2022	UMD	Launchpad participant
Alchemity SOFC	Low-temperature SOFC	Spring 2022	UMD	Launchpad participant and Incorporated
Carbon Lockdown	Wood harvest and burial for carbon sequestration	Spring 2022	UMD	Launchpad participant and Incorporated
Ionic Devices	Battery built using semiconductor manufacturing	Spring 2022	UMD	Launchpad participant
Liatris	Fire-resistant insulation	Spring 2022	UMD	Accelerator participant

To form or augment Startup Teams, MEIA recruits and engages experienced, industry-specific business executives and entrepreneurs ("energy executives") who want to become founders or executives of the Startup to perform its commercialization activities.

This energy executive model creates higher quality leadership teams that, when combined with great technology, produce the investible Maryland-based companies that form the foundation of an emerging economic cluster.

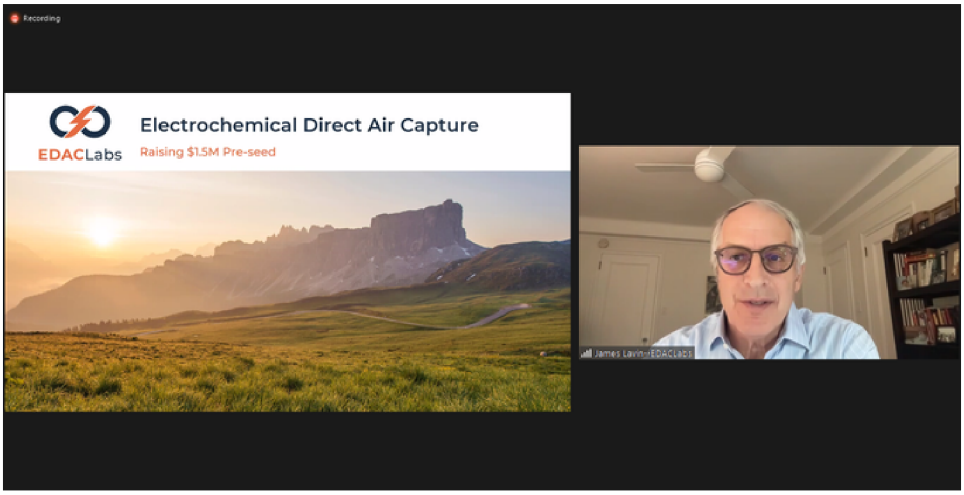
In FY 2022, MEIA was managed by Director Brian Toll with support from Commercialization Program Manager Ben Margolis. MEIA was also supported by interns, who provided excellent research deliverables and created MEIA's blog content.

MEIA INTERNS

Joey Dunn
Commercialization Intern
Washington and Lee, c/o 2022

Nishtaa Modi
Commercialization Intern
Johns Hopkins University, c/o 2025

In June, MEIA hosted a Pitch Competition Finale. The virtual event was the culmination of months of work by teams participating in MEIA's accelerator programs. Four Startup Teams pitched their innovative clean energy product or service to a panel of judges. Baltimore-based **EDAC Labs was named the Grand Prize winner, and awarded a $1,000 Grand Prize sponsored by the Maryland Department of Commerce**. Additionally, each audience member was asked to select one company to receive a hypothetical investment, and **ATP-MD, LLC and Dynami Battery shared the audience choice award for *Most Investible Startup***.



James Lavin, energy executive for EDAC Labs, delivers the $1,000 prize-winning pitch presentation during the MEIA 2022 Pitch Competition Finale.

Multiple organizations provide financial and/or in-kind support to MEIA and its participating Startups.

MEIA Sponsors

MARYLAND CLEAN ENERGY CENTER
MARYLAND ENERGY INNOVATION INSTITUTE
JOHNS HOPKINS RALPH O'CONNOR SUSTAINABLE ENERGY INSTITUTE
exelon
EDA U.S. ECONOMIC DEVELOPMENT ADMINISTRATION
THE BUTZ FOUNDATION
Constellation
BANNER WITCOFF
n.b. Nemphos Broue ATTORNEYS AT LAW
points NORTH small studio. big design.
SNYDERCOHN CPAs and Trusted Advisors
WTP Whiteford Taylor Preston

For more information about MEIA, visit www.mdeia.org.

OUTREACH & EDUCATION

Strengthening the Advanced Energy Network

The Maryland Clean Energy Center continues its investment in outreach and education activities with efforts to build the advanced energy economy in Maryland.

MCEC convenes stakeholders and industry leaders, reports on policy activity that impacts the sector, and offers leadership perspective through participation in industry-related activities and engagement.

FY 2022 Outreach & Education Goals:

- Establish MCEC as a clearinghouse of information between industry, academia, government and consumers
- Provide information about clean energy technologies, products and services to a broad consumer audience to encourage adoption
- Be a resource and provide programming to facilitate industry networking, professional education, and partnerships

Key Outreach & Education Objectives:

- Help customers and business partners connect
- Prioritize industry networking and professional education opportunities with focus on multifamily, C&I, not-for-profit, and academic institution project development
- Educate stakeholders and support industry capacity to engage in policy process

During FY 2022, MCEC continued to interact with stakeholders and assess market needs and trends, while meeting ongoing changes for best practices and audience preferences in response to evolving event best practices and enhanced digital tools.

The Connecting to the Energy Economy Speaker Series was the signature educational production for MCEC, hosted as eight webinars during the fall of 2021.

The virtual program format will remain for the 2022 edition of the series, with the return to the in-person Maryland Clean Energy Summit planned for the fall of 2023.

MCEC measures the impact of its outreach and education activity in event attendance, social media engagement, revenue from program sponsorship, and website hits.

FY 2022 Outreach & Education Impact Metrics

Event attendance counts reflect individuals who participated in the combined events and webinars hosted by MCEC in FY 2022. Email engagement releases reflect MCEC Newsletters, special announcements, and Policy Watch updates sent to subscriber lists, in addition to press releases distributed to media contacts and program specific contact lists.

2021 Speaker Series Webinars

Following the success of last year's webinars, hosted in place of the MD Clean Energy Summit, MCEC produced eight programs for the 2021 Connecting to the Energy Economy Speaker Series.

250 individuals attended the live programs. The vast majority of series participants were based in Maryland, but also included representatives from 16 states, Washington, D.C., and Canada.

CONNECTING TO THE ENERGY ECONOMY SPEAKER SERIES
MARYLAND CLEAN ENERGY CENTER

2021 MCEC Speaker Series Webinar Participant Summary

PROGRAM	SESSION ATTENDEES	RECORDING VIEWS
01 - Transformation to the Grid of the Future	115	104
02 - Climate-Centric Solutions, Strategies & Policies	64	34
03 - Driving Change: The Future of Transportation	89	35
04 - Equity in the Energy Marketplace	47	47
05 - Building & Bankrolling Energy Projects	59	63
06 - Federal & State Investment & Incentives	57	29
07 - Workforce Readiness for Advanced Energy	36	25
08 - Innovation Ahead: Advanced Energy & Carbon Emissions Reduction	58	24

Recording Views as of 11/15/2021

Number of Unique Program Attendees | **250**

Program recordings are available online for FREE viewing at www.mdcleanenergy.org/speakerseries.

Series Sponsors

CohnReznick ADVISORY · ASSURANCE · TAX
Constellation An Exelon Company
NUCLEAR POWERS MARYLAND
SIEMENS Ingenuity for life
BGE An Exelon Company
MARYLAND ENERGY INNOVATION INSTITUTE
pepco An Exelon Company
Maryland Reporter

Policy Watch

2021 Special Session Summary

Maryland legislators took their seats in chambers on Monday, December 6, for the 2021 Special Legislative Session, with a mission to approve Redistricting Maps and the select a State Treasurer to replace retiring Nancy Kopp. With the return to chambers, the Maryland Constitution required the body to address any vetoes exercised by the Governor after the regular session ended.

The Assembly listed 21 bills to override during the special session. Six of the veto overrides pertained to the energy sector, including **SB0460 / HB0419: Economic Development - Advanced Clean Energy and Clean Energy Innovation Investments and Initiatives**.

This legislation broadens the definition of clean energy to include advanced energy and grid modernization technologies; clarifies the capability of MCEC to finance energy measures on state facilities; alters the composition of the MCEC Board of Directors to include an ex-officio seat for the Director of the Maryland Energy Innovation Institute (MEI^2); and provides a predictable, stable, and ongoing commitment of $2.1M to fund energy technology research and development activities through MEI^2 and MCEC.

2022 Maryland Legislative Session Summary

During the 444th Legislative Session of the Maryland General Assembly, MCEC staff tracked 79 pieces of energy legislation, with 42 being cross-files. Thirty-four bills passed their chamber of origination, the opposing chamber, were returned passed, and presented to the Governor for his signature. 62 (24 cross-files) failed due to sponsor withdrawal, unfavorable reports by the assigned committee, or remaining in committee.

Several themes in energy legislation noted during this session, included:

- **Climate Solutions**
- **Transition to Clean Fuel Vehicles**
- **Community Solar**
- **RPS**
- **Resiliency**
- **Environmental Justice, and**
- **Building Performance Standards**

Climate Solutions remained an important issue for legislators, with bills directly affecting the reduction of carbon emissions moving through the process. In contrast, many of the bills addressing environmental justice and building performance remained in committee. The **Climate Solutions Now Act of 2022** addressed those issues. Several pieces of legislation addressing tax or energy credits for renewable energy successfully moved through the process.

Several bills were of particular interest to MCEC, addressing agency transparency, benefits for employees of the organization, and funding for Climate Catalytic Capital.

Policy Watch Summaries and Materials are available at www.mdcleanenergy.org/policy.

Legislative Reception

ON TARGET
CLIMATE & ENERGY POLICY & REGULATION
2022 MCEC LEGISLATIVE RECEPTION

MCEC's Legislative Reception returned in a hybrid format, since it was last held in 2020. The event featured in-person networking at The Governor Calvert House in Annapolis, and hosted remote attendees to hear from guest speakers discussing climate and energy priorities for policy and regulation under consideration by the Maryland General Assembly.

Secretary Mike Gill, MD Dept. of Commerce, gave opening remarks at the 2022 MCEC Legislative Reception. The hybrid event format allowed for remote audience and panelist participation.

152 people attended the Legislative Reception, live: 104 onsite & 48 remotely, representing more than 90 companies, agencies, and organizations.

Guests from the Maryland General Assembly included:

- Sen. Katherine Klausmeier (District 8 - Baltimore)
- Sen. Guy Guzzone (District 13 - Howard)
- Del. Steven Arentz (District 36 - Kent, QA, Cecil & Caroline)
- Del. Kumar Barve (District 17 - Montgomery)
- Del. Steve Johnson (District 34 A - Harford)
- And representatives from the offices of Del. Heather Bagnall (District 33 - Anne Arundel), Del. Mike Rogers (District 32 - Anne Arundel) & Del. J. Sandy Bartlett (District 32 - Anne Arundel).

The program featured panels on *Energy & the Built Environment: Strategies Aimed at Addressing Climate Change* and *Innovation & Regulation: Shooting Toward Energy Targets in Maryland*.

Special Guest Speakers included:

- Peter Franchot - Comptroller of Maryland
- Sen. Bill Ferguson (District 46) - President of the Senate
- Sen. Brian Feldman (District 15) - Vice Chair, Senate Finance Committee
- Sen. Ben Kramer (District 19) - Senate Finance Committee
- Sen. Paul Pinsky (District 22) - Chair, Senate Education, Health & Environmental Affairs Committee
- Del. Eric Luedtke (District 14) - House Majority Leader
- Del. Benjamin Brooks (District 10) - House Economic Matters Committee
- Del. Lorig Charkoudian (District 20) - House Economic Matters Committee
- Del. Lily Qi (District 15) - House Economic Matters Committee
- Mike Gill - Secretary, Maryland Department of Commerce
- Ben Grumbles - Secretary, Maryland Department of the Environment

Event Sponsors

A.O. Smith. Innovation has a name. CTC GLOBAL NEI NUCLEAR ENERGY INSTITUTE delmarva power AN EXELON COMPANY pepco AN EXELON COMPANY

PREPARING FOR THE FUTURE

MCEC FY 2023 Projections

The Maryland Clean Energy Center continues to respond to the evolving advanced energy economy, and works to identify and enhance the unique market opportunities and innovative strengths within the state.

As the Center continues the build-out of green bank capabilities to increase investment in innovation, infrastructure, and partnerships, it also seeks ways to leverage and enhance its role as a unique funding authority. Stakeholder engagement and direct response to changes and needs from the market, remain key to defining the priorities and objectives for MCEC now, and into the future.

FY 2023 priorities for MCEC include:

Environmental Justice & Equity in the Energy Sector

C3 Fund Focus

Enhanced Resources for Consumer Education

- Energy 101 Resource Guide: The updated publication will be completed by the end of the year, with distribution of the printed guide during the 2023 Maryland Legislative Session. The content will also be used for website and digital resources that will be supplemented by a clean energy metrics dashboard.
- *Buying and Selling Properties with Solar Systems* CE Course for Realtors

Overarching Strategic Plan Goals:

Facilitate access to capital for clean energy project and business development.

- Successfully provide financing and technical support for various consumer audiences, including initiatives to address workforce development and energy equity for underserved communities.
- Serve as a conduit for partnerships between industry and community stakeholders.

Support innovation advancement to develop clean energy and climate tech ecosystem in Maryland.

- Facilitate translation of clean energy and climate tech discoveries to marketable products and services.
- Promote business and job creation in the clean energy and climate tech sectors.

Position MCEC as a clearinghouse of information between industry, academia, government, and provide information about clean energy technologies, products and services to a broad consumer audience to encourage adoption.

- Be a resource and provide programming to facilitate industry networking, professional education, and partnerships.

Establish MCEC value in the marketplace in efforts toward achieving its mission.

- Operate MCEC as an effective and impactful instrumentality of state.
- Generate fee income and revenue streams from financing transactions for MCEC.

A digital version of the FY 2022 Maryland Clean Energy Center Annual Report is available for download at www.mdcleanenergy.org/about-mcec/enabling-statute/annual-reports.

MARYLAND
CLEAN ENERGY CENTER

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