ROCKVILLE

ECONOMIC DEVELOPMENT, INC.

MARYLAND

Advancing Clean Tech in Rockville

Leveraging Emerging Opportunities for Economic Development

November 21, 2024

GOALS OF THIS PRESENTATION

- ☑ Define Clean Tech
- ☑ Review the Clean Tech landscape
- ☑ Recommendations

INTRODUCTION TO CLEAN TECHNOLOGY

WHAT IS CLEAN TECH?

- Clean Tech is synonymous with Green Tech and Climate Tech
    - *Per the 2023 Maryland Climate Tech Look Book produced by Maryland Clean Energy Center, the Maryland Energy Innovation Accelerator (MEIA), John Hopkins & University of Maryland Energy Innovation Institute "**Clean tech** includes any new business model or technology that increases production performance, productivity, and efficiency while minimizing negative environmental impacts.*

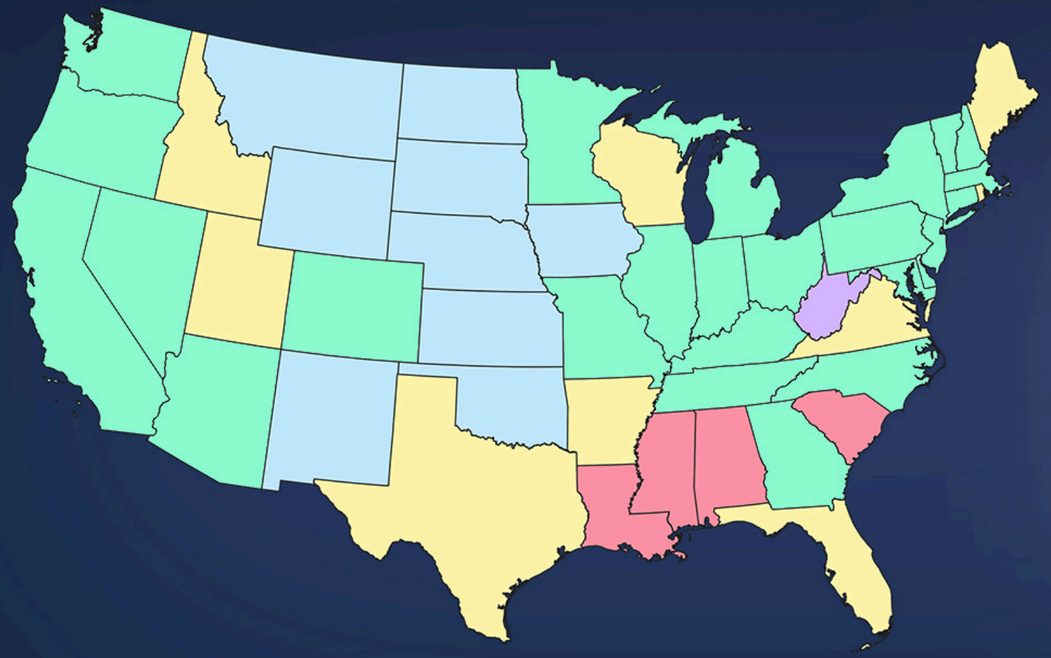
CLEAN TECH CATEGORIES

Energy & Energy Storage	Circular Economy	Sustainable Water Management	Sustainable Mobility	Chemicals and Advanced Materials	Energy efficiency
Power Generation of Renewable Energy/ Solar, Nuclear	Waste Collection & Transport	Ground Water Monitoring	Alternative Fuels	Cross-sectional Technology	Industry-specific Energy Efficiency
Environmentally friendly use of fossil fuels	Waste Utilization	Water Utilization	Alternative Drive Technology	New Materials	Efficient Appliances
Storage Technologies	Waste Disposal	Efficiency Increases in Water Utilization	Infrastructure Traffic Control	Material Efficient Processes	Energy Efficient Buildings
Efficient Grids	Environmental Remediation		Sustainable Mobility Management	Sustainable Design	

CLEAN TECH INDUSTRY LANDSCAPE

CLEAN ENERGY INVESTMENT

Public and private investment, 2018 - June 2024



TOP TECHNOLOGY
ZERO-EMISSION VEHICLES
SOLAR
WIND
HEAT PUMPS
CARBON MANAGEMENT

Clean energy technologies with the highest total public and private investment (2018 - June 2024) in each state. Solar includes renewable energy storage. Zero-emission vehicles include battery manufacturing.
Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor.

CLIMATE CENTRAL

REGIONAL INVESTMENT IN CLEAN TECH

U.S. Census Region	Total Clean Investment
South*	$428 Billion
West	$327 Billion
Midwest	$149 Billion
Northeast	$90 Billion

Source: Climate Central
*Maryland is in the Southern Region

CLEAN TECH INVESTMENT BY STATE

State	Total Clean Investment (Q1 2018 -Q2 2024)	Top Technology
California	$191 billion	Zero-emission vehicles (52%)
Texas	$144 billion	Solar power (32%)
Florida	$63 billion	Solar power (34%)
Georgia	$50 billion	Zero-emission vehicles (35%)
North Carolina	$32 billion	Zero-emission vehicles (39%)
Arizona	$31 billion	Zero-emission vehicles (33%)
New York	$30 billion	Zero-emission vehicles (49%)
Tennessee	$28 billion	Zero-emission vehicles (67%)
Michigan	$25 billion	Zero-emission vehicles (71%)
Nevada	$25 billion	Zero-emission vehicles (39%)
Maryland	**$11 billion**	**Zero-emission vehicles (52%)**

FEDERAL INVESTMENT

- In 2022, the Biden-Harris Administration signed the Inflation Reduction Act (IRA), the largest investment in clean energy and climate action ever.
- It was estimated that the IRA's clean energy and climate provisions have created more than 170,000 clean energy jobs.
- CHIPS and Science Act of 2022 was implemented to strengthen American manufacturing, supply chains, and national security and invest in research and development, science and technology, and the workforce of the future.
- In 2023, the private sector announced more than $110 billion in new clean energy manufacturing investments, including more than $70 billion in the electric vehicle (EV) supply chain and more than $10 billion in solar manufacturing.
- Research grants and federal funding from organizations like the Department of Energy (DOE) and National Institutes of Health (NIH) help fuel clean tech innovation.
- DOE earmarked nearly $150M for 67 clean tech projects at federal facilities through the Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) grant program.

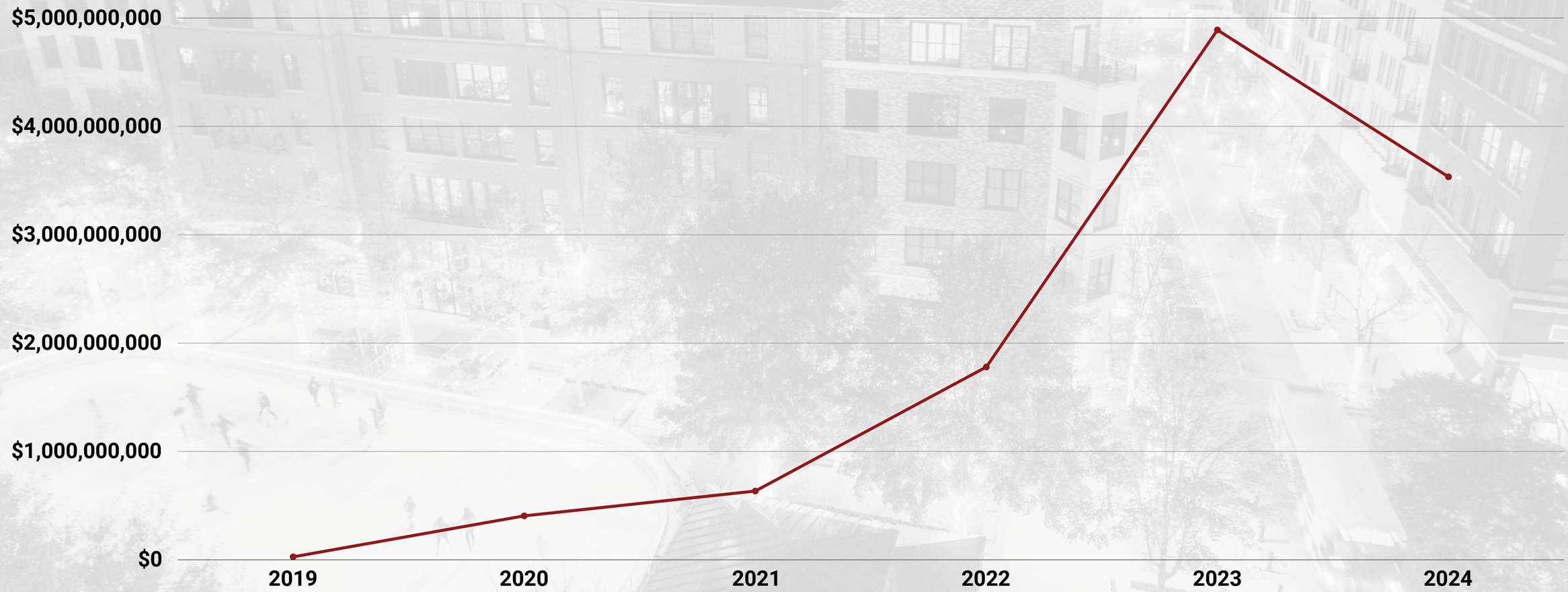
VENTURE CAPITAL INVESTMENT ACTIVITY

- The US saw a 40% increase in public and private investment in clean tech manufacturing and deployment in the first nine months of 2023.

- Venture capital (VC) investment in clean tech startups started to decline towards the end of 2023, but the drop was relatively small compared to the overall decline in VC investment across all sectors.

- According to the International Energy Agency (IEA), by 2030, the estimated investment in clean energy could reach around $4.5 trillion per year globally to meet the target of limiting global warming.

U.S. INVESTMENT ACTIVITY 2019 - 2024



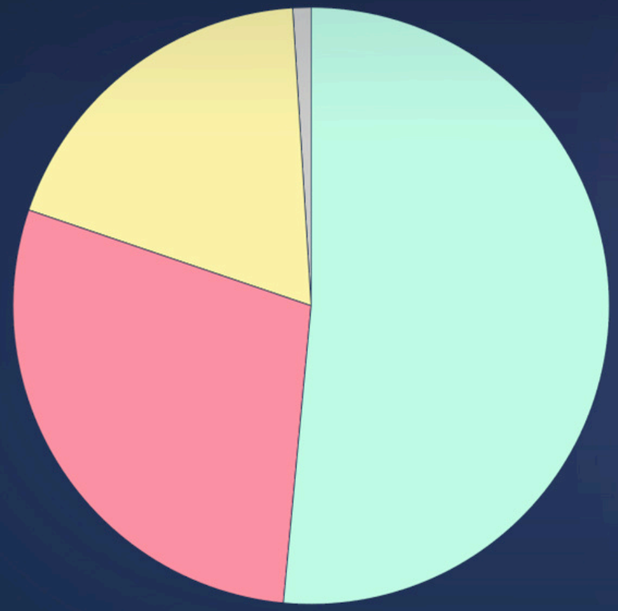
INVESTMENT TRENDS

- Seed funding increased while growth funding took the biggest hit.
- Funding for crop inputs continued to grow as the global population grows and weather patterns change.
- Funding for technologies to decarbonize animal proteins increased.
- Battery manufacturer Contemporary Amperex Technology Limited or CATL began mass-producing sodium-ion packs in the second half of 2023.

Maryland

CLEAN ENERGY INVESTMENT

Public and private investment, 2018 - June 2024



$11 BILLION

ZERO-EMISSION VEHICLES	52%
HEAT PUMPS	29%
SOLAR	18%
OTHER	1%

Total public and private investment (in 2023 USD) in clean energy technologies in each state.
Zero-emission vehicles include battery manufacturing.
Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor.

CLIMATE CENTRAL

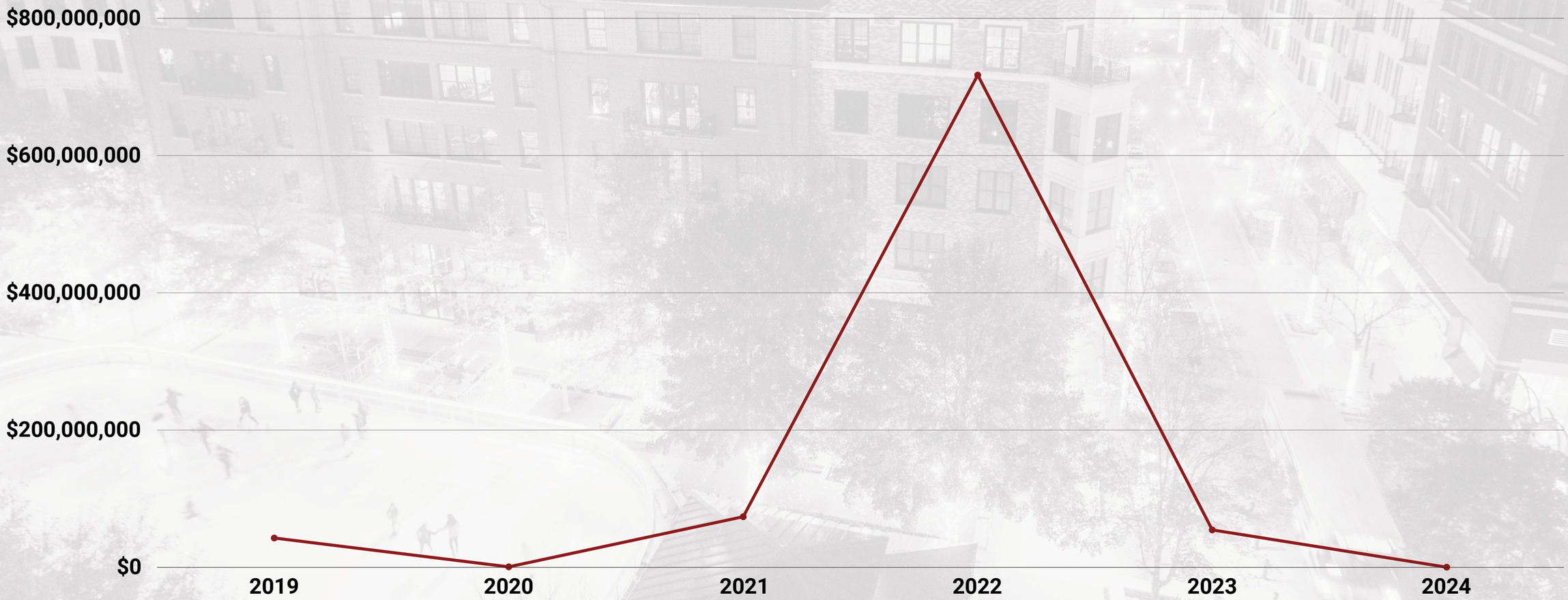
STATE OF MARYLAND INVESTMENT

- Biden-Harris Administration Announces Maryland Clean Energy Center to Receive $62 million.
- The Decarbonizing Public Schools Program will provide more than $33 million in new capital to help local education agencies.
- The Maryland Clean Energy Center (MCEC) launched the Climate Catalytic Fund, which has an allocation of $15 million.
- Higher Education Clean Energy Grant Pilot Program - a $9.2 million competitive pilot opportunity to support clean energy transitions within Maryland's colleges and universities.
- The Climate Technology Founder’s Fund could provide as much as $1,200,000 in each fiscal year- 2025 through 2028.

MONTGOMERY COUNTY, MD INVESTMENT

- From 2019-2023, Montgomery County saw a total of $890 Million in VC and Private Equity Deals in the Clean Tech Sector.
- The largest deal during that time was a Rockville company, Standard Solar, and it was worth $700 million.
- This deal alone accounted for almost 80% of deals in Montgomery County.
- In October of 2024, X-energy Reactor Company, LLC (“X-energy”), a leader in advanced nuclear reactor and fuel technology, announced a Series C financing round of approximately $500 million, anchored by Amazon.

MONTGOMERY COUNTY CLEAN TECH INVESTMENT DEALS 2019 - 2024



ROCKVILLE CLEAN TECH COMPANIES

Montgomery County has 52 clean tech companies with **26% located in Rockville, MD.**

- **Rockville Clean Tech Companies:**

  - X-energy
  - Standard Solar
  - Compost Crew
  - Kauai Wdf LLC
  - PQ Energy, LLC
  - Em Energy Inc.
  - Remote Orbital Micro Energy
  - Pirl
  - Energy Dynamics
  - POWER QUALITY INC.
  - Necenergy Consultants
  - Montgomery County Green Bank
  - Liatris Inc.
  - NextGlass

UNITED STATES EMPLOYMENT TRENDS

- The U.S. Department of Energy (DOE) released the 2024 U.S. Energy and Employment Report (USEER), a comprehensive study designed to track and understand employment trends across the energy sector.

- As the private sector continued to announce major investments in American-made energy spurred by the Biden-Harris Administration’s Investing in America agenda, the 2024 USEER shows that the energy workforce overall added over 250,000 jobs in 2023; 56% of those were in clean energy.

- According to E2's 2024 Clean Jobs America report, every clean energy sector grew at least twice as fast as overall national employment & over the past three years, clean energy jobs increased by 14 percent to nearly 3.5 million workers

MARYLAND EMPLOYMENT TRENDS

- Maryland had 127,479 energy workers statewide in 2023, representing 1.5% of all U.S. energy jobs.
- Of these energy jobs, 67,772 of jobs in energy efficiency, and 24,972 in motor vehicles.
- 15,807 are in electric power generation, representing 1.7% of the nation's total.
- 15,152 in transmission distribution and storage & 3,777 of MD jobs are in fuels
- From 2022 to 2023, energy jobs in the state increased by 2,553 jobs, or 2%.
- As a percentage of the total number of jobs in the state, Vermont has the highest proportion of clean energy jobs (5.2%), followed by Massachusetts (3.4%), California (3.1%), South Dakota (3.1%) and Maryland (3.0%).

FUTURE WORKFORCE NEEDS

- The clean tech industry will need a significant increase in its workforce to meet climate and energy goals. The workforce will need to include both blue-collar and white-collar workers with a variety of skills.

- Blue-collar workers - construction laborers, electricians, and equipment operators are expected to be in high demand.

- White-collar workers - project developers, engineers, and finance professionals are expected to be in high demand.

- Other clean energy jobs - wind turbine service technicians, solar photovoltaic installers, sustainability specialists, environmental scientists, and urban planners are all expected to see job growth

COMMERCIAL REAL ESTATE NEEDS OF CLEAN TECH COMPANIES

- Clean tech companies can operate in a variety of space that including office, manufacturing space and lab space.
- Clean tech's real estate needs are often similar to those of life sciences firms. Some include significant amounts of electrical capacity and advanced mechanical and HVAC equipment.
- While clean tech won't fill all lab or biomanufacturing space, real estate executives view clean energy as a major future demand driver.
- Markets like Massachusetts are leasing lab space to clean tech companies, with hundreds of thousands of square feet already leased.

CLEAN TECH STRENGTHS

- Current entrepreneurship ecosystem support with programs like: The Maryland Energy Innovation Institute, John Hopkins Ralph O'Connor Sustainable Energy Institute, Bethesda Green, & Maryland Technology Enterprise Institute.
- Research institutions like Johns Hopkins University, UMD and NIH can provide funding and expertise, particularly in biotech waste management.
- State government incentives opportunities.
- Presence of a highly educated workforce, particularly with expertise in science, technology, and engineering.

CLEAN TECH WEAKNESSES

- Competition from neighboring states with similar incentives such as Virginia and Pennsylvania.
- Limitations in grid capacity.
- Limited venture capital access.
- Potential reduction in federal incentives.
- Clean energy projects are subject to high upfront costs and have a high sensitivity to interest rates.

CLEAN TECH OPPORTUNITIES

- Lockheed Martin is headquartered in Bethesda and can attract smaller startups that specialize in sustainable aviation fuels.
- Lockheed Martin’s investment arm, Lockheed Ventures, has invested in cleantech companies and building a relationship with them can be used to help attract and retain smaller startups.
- Local universities and community colleges, such as Montgomery College & USG offer clean tech-related courses and certification programs, supporting workforce development in clean energy and sustainability sectors.

CLEAN TECH THREATS

- Future policy and regulatory risks could impact private investment activity.
- Economic downturns could impact investment and growth in clean tech projects.
- Natural disasters could pose risks to cleantech in infrastructure and supply chain management.
- Maryland has a high cost of living and operating a business relative to other states in the nation.

RECOMMENDATIONS

- Continue to promote and build relationships with State organizations like the Maryland Energy Innovation Accelerator (MEIA) that provide mentorship, funding, and access to state-of-the-art research resources.
- Strengthen ties with local universities, that support the cleantech industry such as the University of Maryland, Montgomery College, and USG, to support the workforce.
- Work with organizations like Montgomery Green Bank to promote Green Energy initiatives and create programs for small business investment.
- Reevaluate existing grant programs to support industry growth.

ROCKVILLE
ECONOMIC DEVELOPMENT, INC.
MARYLAND

THANK YOU!

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