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Project name: Building Energy Transition  
Implementation Task Force,  
Technical Assistance

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# Task Force Recommendations: Analysis

AECOM was tasked with analyzing specific questions supporting potential recommendations for the Building Energy Transition Implementation Task Force. The specific questions, associated potential recommendation and the results of AECOM's analyses are captured below.

## Question 1

### Associated Potential Recommendation:

Cover 100% of the additional cost of installing heat pumps in all LMI households and cover 50% of the additional cost of installing heat pumps in all middle-income households, from 2025-2044.

### Question:

Based on Rewiring America's work, what is the annual cost to the state for covering 100% of the incremental cost (additional to typical replacement) of installing heat pumps in all LMI households that don't already have heat pumps, as well as for covering 50% of the additional cost of installing heat pumps in all middle-income households that don't already have heat pumps, from 2025-2044? (Assume that heat pump prices and labor costs could change over time and provide an annual cost for each year between 2025 and 2044, not just an average annual cost over that time period.)

### Results:

The total additional cost for installing heat pumps over typical fossil fuel replacements for 100% of Low Income (< 80% Area Median Income) households, and 50% of the additional cost for Middle Income (80-150% AMI) households is \$11.87 billion. If this total \$11.87 billion cost is spread evenly over the 20-year period between 2025-2044, the annual cost is \$593.4 million per year. When the annual cost decrease factor is applied to account for changes in the price of technology and labor, the total is \$10.32 billion and the annualized value starts at \$593.5 million in 2025 reducing down to \$445.3 million in 2044.

### Analysis:

Based on data provided by Rewiring America, the total additional cost for installing heat pumps over typical fossil fuel replacements is estimated to be \$7.29 billion for < 80% AMI (Low Income) households and \$9.15 billion for 80-150% AMI (Medium Income) households. Taking 100% of the <80% AMI value and 50% of the 80% - 150% value equates to the \$11.87 billion total, and \$593.4 million annualized.

The \$593.4 million annualized cost does not take into consideration possible changes to heat pump prices or cost of labor over time. Technology costs will likely go down over time due to advancements in heat pump technology / manufacturing policy / economics, such as the DOE heat pump challenge.<sup>1</sup> Based on studies by NREL and European research institutions, the total installed costs for heat pumps will decrease in the range of 0.7% - 2.5% per year.<sup>2</sup> To capture this, an annual cost decrease of 1.5% (taken from the NREL study) was applied, which is also the cost reduction goal set by the IEA (International Energy Agency) by 2050. When this factor is applied, the annual cost decreases by 1.5% year over year from \$593.4 million in 2025 down to \$445.3 million in 2044. Table 1 shows the total cost estimates with and without applying the 1.5% YOY cost decrease.

<sup>1</sup> <https://www.energy.gov/eere/buildings/residential-cold-climate-heat-pump-challenge>

<sup>2</sup> <https://www.nrel.gov/docs/fy18osti/70485.pdf>

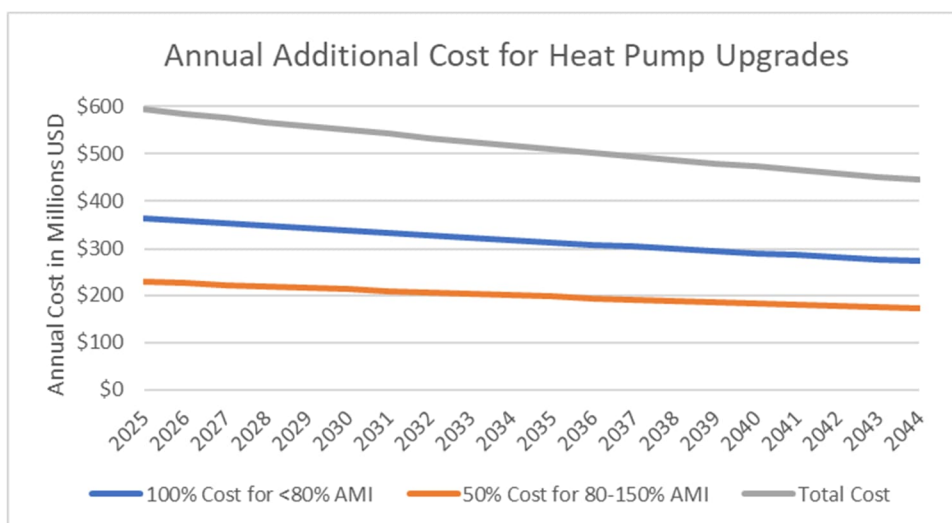
Table 1: Additional Cost Estimates with and without 1.5% YOY Cost Decrease

Household Income Level	Additional Cost for Heat Pump (Assuming No YOY Cost Decrease)	Additional Cost for Heat Pump (Assuming 1.5% YOY Cost Decrease)
<80% AMI	\$7.29 billion	\$6.34 billion
50% Cost for 80-150% AMI	\$4.58 billion	\$3.98 billion
<b>Total</b>	<b>\$11.87 billion</b>	<b>\$10.32 billion</b>

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The difference in annual costs from 2025 to 2044 with the decrease factor are visualized in Figure 1. The total cost over the 20-year period when the 1.5% annual cost decrease is applied is \$10.32 billion.

Figure 1: Annual Additional Cost Estimates with 1.5% YOY Cost Decrease



## Question 2

### Associated Potential Recommendation:

Cover the cost of continuing the IRA HEAR rebate after it runs out (expected by EOY 2024 in Maryland) to continue to provide rebates for heat pump installation for 100% of the < 80% AMI households and 50% of the 80% - 150% households.

### Question:

What is the annual cost to the state from 2025-2044 for continuing to offer the IRA HEAR rebates (for heat pumps, wiring, panel upgrades, etc.) after federal funds run out? MEA expects those funds will run out quickly, probably in just a year or two. Assume that MD will distribute its HEAR rebates by the end of 2024 and would need a new funding source to keep the program running in 2025 and beyond. How much funding would be required to offer the HEAR rebates to all households in MD that won't already all-electric when the federal funding runs out next year? Provide an annual cost for each year between 2025 and 2044, not just an average annual cost over that time period.

Assumptions:

- Rebate levels and income eligibility remain the same as established for the federal program.
- The transition to a fully electrified residential building sector completes in 2044.

- Heat pump prices and labor costs could change over time.

## Results:

### Extending the IRA HEAR rebate:

This initial part of this analysis was conducted to understand the full impact of extending the IRA HEAR program without considering other programs or incentives. The cost to cover the remaining <80% AMI and 80-150% AMI households after the IRA HEAR funds run out is \$14.23 billion. For the state of Maryland to continue this program from 2025 to 2044, the \$14.23 billion annualized over those 20 years will be \$711 million per year.

### Incorporating additional sources of funding:

Additional sources of funding are expected to support the installation of heat pumps in Maryland, reducing the overall \$14.23 billion significantly. When including expected IRA Tax Credits, the MEA Low-to-Moderate Income Energy Efficiency Grant, and EmPOWER rebates, the cost from 2025 – 2044 to cover the same upgrades as the IRA HEAR will be \$8.51 billion with an annualized cost of \$425 million. If the expected annual cost decrease of technology and labor (1.5%) is applied, the total cost comes down to \$7 billion.

## Analysis:

The IRA HEAR program is expected to remain available through 2031<sup>3</sup> with \$68 million allocated to the state of Maryland, but MEA expects those funds to run out quickly. This program provides 100% of the heat pump upgrades costs for <80% AMI households and 50% of the costs for 80-150% AMI households with a \$14,000 cap per household. Based on Rewiring America's data, <80% AMI households would receive \$12,000 per household in funding and 80-150% AMI households would receive \$9,612 per household. The \$68 million allocation to Maryland will only be able to cover a small fraction of the total cost for all <80% AMI and 80-150% AMI households in Maryland.

This analysis was conducted assuming rebate levels and income eligibility remain the same as established for the IRA HEAR program, and that the total cost of continuing the program will be evenly distributed over the 20 years from 2025 – 2044.

Additional funding to support heat pump installation throughout the state can come from IRA Tax Credits, the MEA Low-to-Moderate Income Energy Efficiency Grant, and EmPOWER rebates. The MEA grant of \$16.5 million in 2023 is assumed to continue every year over the 20 year analysis period, and the IRA Tax Credits of \$809 million total are included. The total \$2.65 billion in IRA Tax Credits was taken from Rewiring America data and spread evenly over the 2025 – 2044 time period. The \$136.9M per year in funding from EmPOWER is currently the total amount of funding the program has with the majority not committed to electrification projects.

For this analysis, the EmPOWER funding was applied in full towards the support of installing heat pumps with the assumption that the EmPOWER program is going to be modified as MD state goals continue to develop to support electrification efforts. Currently, the DHCD program from EmPOWER provides \$127 million across all years<sup>4</sup> to fund electrification for <80% AMI households, while other EmPOWER programs fund efficiency upgrades which include fossil fuel upgrades. This analysis shows that if funding from EmPOWER can be focused fully on electrification efforts and away from upgrades to fossil fuel fired equipment, then the cost to Maryland to continue the HEAR rebates for all eligible households can be significantly reduced.

## Question 3

### Associated Potential Recommendation:

The model for an apprenticeship program/workforce development program should include:

<sup>3</sup> Details of the HEAR rebate (formerly HEEHRA) can be found here: <https://www.energy.gov/articles/biden-harris-administration-announces-state-and-tribe-allocations-home-energy-rebate>

<sup>4</sup> Taken from Rewiring America's analysis.

- Identifying the career pathways that Maryland wants to support.
- Partnering with organizations to create, sponsor, and promote programs.
- Providing and leveraging funding for these programs.
- Promoting the programs and educating target communities on ways to get involved.

### Question:

What is the model for an apprenticeship program/workforce development program?

### Results:

Maryland already has experience creating apprenticeship and workforce development programs as the state offers 148 training programs with over 57% of those focusing on energy efficiency or renewable energy. The Division of Workforce Development and Adult Learning oversees the Maryland's American Job Centers, which offer free, in-person assistance to businesses and job seekers, and the Maryland Workforce Exchange, which operates online to connect job seekers with trainings and opportunities.<sup>5</sup> Additionally, the Maryland Apprenticeship and Training Program connects job seekers and employers to generate successful apprenticeship opportunities.<sup>6</sup> The State also has helpful tools online to connect businesses with available grant funding that can help support their workforce development programs.<sup>7</sup>

Important steps when building an apprenticeship program or workforce development program are:

- Identifying the career pathways that Maryland wants to support.
- Partnering with organizations to create, sponsor, and promote programs.
- Providing and leveraging funding for these programs.
- Promoting the programs and educating target communities on ways to get involved.

Each of these steps is described in more detail in the Analysis section.

### Analysis:

#### Identifying the career pathways that Maryland wants to support.

Maryland must begin with identifying goals that can be achieved by increasing its building decarbonization workforce. The State should take a stock of the existing workforce and identify which workforces are struggling to keep up with demand for the BEPS transition. This could include solar PV installation, weatherization retrofits, home heating and cooling repair, and more. There are many carpenters, electricians, plumbers, roofers, HVAC technicians, energy auditors, and more that could benefit from workforce development pathways that can transition them more easily into jobs focused on building decarbonization. The [Green Buildings Career Map](#) identifies important jobs in the building decarbonization space to focus on for development efforts. It is important to develop training models that can benefit future development by identifying gaps in the existing workforce and aligning those with the future goals for the industry; in this case, full building decarbonization.

#### Partnering with organizations to create and promote workforce development and apprenticeship programs.

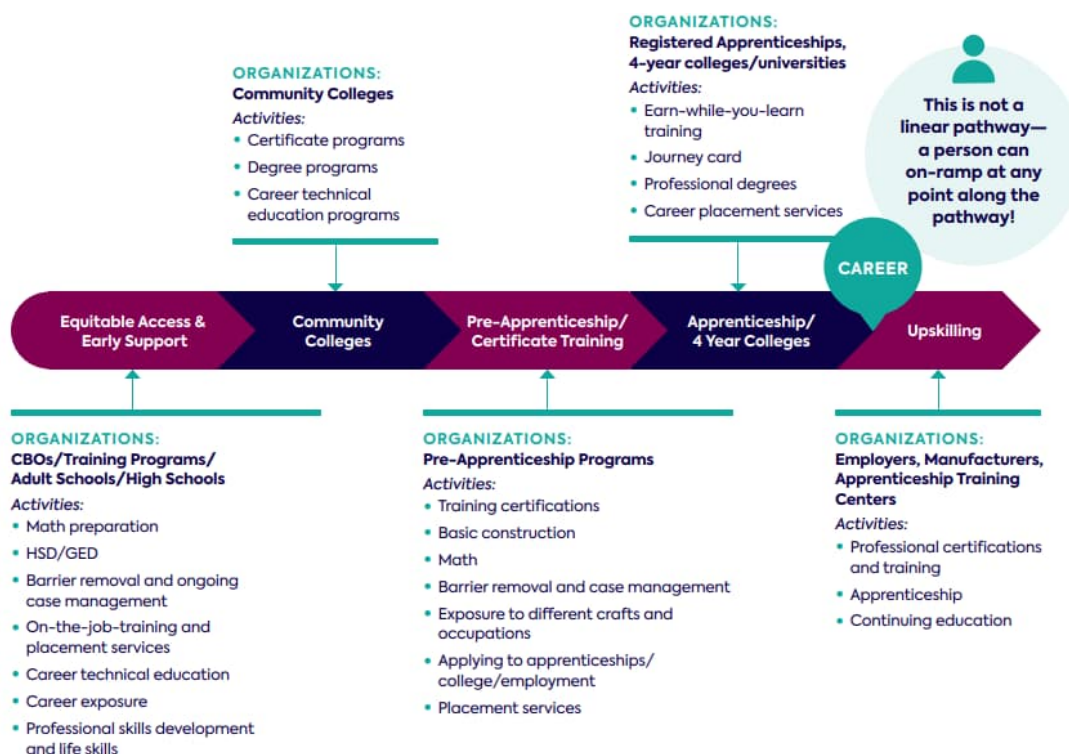
There are many groups and associations that can provide the education, training, or apprenticeship experience desired at each step of the way in a career pathway. The Barr Foundation's High-Road Clean Energy Workforce Pathway, shown in Figure 2, is a working model that reveals just how many organizations are included in an individual's career pathway.

<sup>5</sup> <https://www.dlr.state.md.us/county/>

<sup>66</sup> <https://www.dlr.state.md.us/employment/appr/>

<sup>7</sup> <https://businessexpress.maryland.gov/grow/workforce/workforce-training-grants>

Figure 2: High-Road Clean Energy Workforce Pathway<sup>8</sup>



Maryland should determine which organizations to partner with to encourage workforce development and/or apprenticeship programs in building decarbonization fields. Maryland Works for Wind Project Partners include Local Workforce Development Areas, Business Alliances, Employers, Tier I Training Providers, and Tier II Training Providers with multiple organizations serving in each of those categories.<sup>9</sup> A similar network should be created for each energy efficiency, resiliency, and decarbonization management workforce development/apprenticeship program.

**Providing and leveraging funding for workforce development and apprenticeship programs.**

Funding for workforce development and apprenticeship programs can come from private, local, state, and federal sources and be used for a myriad of program aspects. Funding could be used for wage reimbursement, training cost sharing, economic inclusion, loans for education, and more.

Examples of available funding opportunities in the state of Maryland are listed on the [Maryland Business Express: Workforce Training Grants](#) website. The Maryland Energy Administration (MEA) also supports the Maryland Offshore Wind Workforce Training Grant Program with Strategic Energy Investment Fund (SEIF) funding to support businesses or government entities in operating new or existing training centers. Public-private partnerships can also be leveraged to combine public resources and private sector funding to maximize the benefits from state funding and other private investors. Examples of private funding can be from employers, philanthropies, industry groups, and more.

An example of creative funding that can go towards workforce development comes from Portland, OR, where a 1% surcharge on revenue from retail sales on large retailers was administered to create funding for workforce development.<sup>10</sup> Revenue generated supports the Portland Clean Energy Community Benefits Initiative which focuses funds on low-income and underserved populations to create living-wage green energy jobs and to conduct retrofits on low-income homes.<sup>11</sup> The

<sup>8</sup> <https://www.barrfoundation.org/reports/building-new-england-clean-enegey-workforce>

<sup>9</sup> <https://www.dlr.state.md.us/employment/marylandworksforwind/>

<sup>10</sup> Note that this tax did translate to a 1% increase in cost to consumers at select stores, like Safeway, but the intention was to only apply to the business.

<sup>11</sup> <https://www.oregonlive.com/portland/2019/10/portland-voters-put-a-1-sales-tax-on-large-retailers-but-some-consumers-are-paying-it-instead.html>

city had originally estimated the surcharge would generate \$40-60 million/year but ended up leading to a total of \$145 million in grants in two years with an expected additional \$750 million in funding through 2028.<sup>12</sup>

### **Promoting the programs and educating target communities on ways to get involved.**

The Barr foundation published a report highlighting various successful workforce development programs in New England specifically focused on building jobs in Clean Energy. Many case studies included the development of a Community Workforce Agreement or Community Benefits Agreement framework that recommends best practices in terms of allocating a specific percentage of project work hours for target hiring populations, apprenticeship goals, and more.<sup>13</sup> The framework is intended to provide carveouts or specific support for minority, women, and disadvantaged business enterprises (MWDBE) while also supporting development in low-income communities by targeting low-income populations. This type of framework established at the state level could generate increased apprenticeship and workforce development programs on the city and project level.

In addition, instituting a Workforce Hub focused on generating more jobs in the building decarbonization space will assist in developing the workforce and can target specific communities. Illinois' Clean Jobs Workforce Network Program is an example of a robust program that targets priority participants to provide training, certification preparation, and skill development at 13 Workforce Hubs across the state.<sup>14</sup> The Workforce Hubs train entry-level positions in solar, wind, building energy efficiency, and EV maintenance using a clean jobs curriculum framework. The program prioritizes participation for people residing in R3 areas, EJ communities, and displaced energy workers who face barriers to employment. This program can serve as a model for Maryland in program development.

## **Question 4**

### **Associated Potential Recommendation:**

Develop one of the following approaches to incentivize contractors to work in LMI communities:

1. Provide a financial incentive to a given contractor for each LMI household they serve.
2. Provide a financial incentive to organizations that want to support workforce development in the building decarbonization space while partnering with a local contractor.
3. Provide a financial incentive to a given group of state-approved contractors who will service local areas.

### **Question:**

Can you develop an estimate on how much it would cost to incentivize contractors to serve the low-income housing market and to create good jobs for people from these communities? AECOM to evaluate the cost to incentivize contractors through research of relevant programs in other states/jurisdictions.

### **Results:**

1. Provide a financial incentive to a given contractor for each LMI household they serve.
  - o This incentive program can be modeled after the IRA rebates where contractors are given a \$200 flat rate incentive per home in a low-income community for Home Efficiency Rebates (HER) and up to \$500 per any household for Home Electrification and Appliance Rebates (HEAR). These rebates cannot be applied together, but assuming that every subsidized, low-income unit in the state receives a rebate, the cost of this incentive would be between \$20.6 million if each subsidized low-income unit was upgraded with HER

<sup>12</sup> <https://www.opb.org/article/2023/08/24/portland-clean-energy-fund/>

<sup>13</sup> <https://www.barrfoundation.org/reports/building-new-england-clean-energy-workforce>

<sup>14</sup> <https://dceo.illinois.gov/climateandequitablejobs/clean-jobs-workforce-network-program.html>



and \$51.4 million if each subsidized low-income unit was upgraded with HEAR and the incentive was maxed out at \$500.

2. Provide a financial incentive to organizations that want to support workforce development in the building decarbonization space while partnering with a local contractor.
  - An example program is the Illinois Climate and Equitable Jobs Act that targets \$80 million annually for clean energy workforce and contractor development programs in Black and Brown Communities. The main applicant in this process must be a nonprofit organization that is a community-based provider, but they are encouraged to partner with employers or contractors to determine the workforce needs of the area and each grant is expected to be \$10,000 per participant enrolled. A similar program could be employed with contractors being paid a specific amount of funding per participant they train and invest in from a LMI community.
3. Provide a financial incentive to a given group of state-approved contractors who will service local areas.
  - Maryland could create partnerships with contractors in which they incentivize a select group to commit to supporting local LMI communities and make that list readily available to community members. This would allow MD to increase the total incentive they can provide to a specific contractor from an overall smaller funding pool. There are no existing programs like this, and the Task Force will need to drive cost estimation.

## Analysis:

Most incentives for low-income housing upgrades have been aimed at homeowners instead of at contractors. However, changes are likely to be coming with the recent IRA rebates that include contractor incentives for home efficiency and electrification upgrades in LMI communities. There are three potential approaches to providing incentives to contractors to work in LMI communities:

### 1. Provide a financial incentive to a given contractor for each LMI household they serve.

A program that provides a financial incentive to a given contractor for each home they help decarbonize would work similarly to a rebate that is administered to a contractor for each energy efficient upgrade they provide to a home in a low-income community. This type of funding scheme is being introduced with the IRA rebates. Contractors are given a \$200 flat rate incentive per home in a disadvantaged, low-income community for Home Efficiency Rebates (HER) and up to \$500 per any household for Home Electrification and Appliance Rebates (HEAR).<sup>15</sup> However, states have the choice to only give incentives to contractors in low-income communities.

The dollar amount of the rebate in this case can be used to estimate the cost of a program that would incentivize contractors to serve the low-income housing market. These rebates cannot be applied together, but assuming that every subsidized, low-income unit in the state receives a rebate, the cost of this incentive would be between \$20.6 million if each subsidized low-income unit was upgraded with HER and \$51.4 million if each subsidized low-income unit was upgraded with HEAR and the incentive was maxed out at \$500.<sup>16</sup> In practice, a program run by the State would continue the HER and HEAR rebates after the IRA runs out and would overall require less funding than the estimated \$20.6 million and \$51.4 million, respectively, to account for IRA funds administered.

### 2. Provide a financial incentive to organizations that want to support workforce development in the building decarbonization space while partnering with a local contractor.

Contractor incentives for workforce development in LMI communities is hard to quantify, as contractors have not typically been the only group funded for this endeavor. Many grants are available to educational facilities, employers, community groups, or other organizations that want to get involved in programs. An example of grant funding is the Illinois Climate and Equitable Jobs Act targets \$80 million annually for clean energy workforce and contractor development programs in Black and Brown Communities. The main applicant in this process must be a nonprofit organization that is a community-based provider, but they are encouraged to partner with employers or contractors to determine the workforce needs of the area and each grant is expected to be \$10,000 per participant enrolled. A similar program could be employed with contractors being

<sup>15</sup> <https://building-performance.org/bpa-journal/10-key-contractor-takeaways-from-does-new-ira-rebate-guidelines/>

<sup>16</sup> Subsidized low-income units as identified in the MDE Building Stock Data Summary as 102,878 units.

paid a specific amount of funding per participant they train and invest in from a LMI community. A program cap could be applied at any level based on the amount of funding the State wants to provide per participant or the number of projects they want to fund.

**3. Provide a financial incentive to a given group of state-approved contractors who will service local areas.**

There are no examples of a program that provides financial incentives for a given group of approved contractors to support LMI communities, but states, programs, and projects have provided lists of approved contractors for other programs in the past. For example, the New York State Energy Research & Development Authority (NYSERDA) has a statewide network of partners they endorse for contractor needs. On a specific program level, Maryland could create partnerships with contractors in which they incentivize a select group to commit to supporting local LMI communities and make that list readily available to community members. This would allow MD to increase the total incentive they can provide to a specific contractor from an overall smaller funding pool.

**Additional Examples of Workforce Developments:**

Funding programs that support MWDBE investment and development rather than just incentivizing contractors lead to community benefits as well without going through contractors. Additional options for funding that would promote building decarbonization jobs in LMI communities, but do not include contractor specific incentives, are shown in the table below:

Relevant Program/Regulation	Funding Amount	Funding Source	Workforce Development/Training Programs	Equity/Justice
Clean Energy Workforce Development and Training (NY)	<ul style="list-style-type: none"> <li>\$120M through 2025</li> <li>With funding caps for each program and its selected projects</li> </ul>	<ul style="list-style-type: none"> <li>New York State Energy and Research Development Authority (NYSERDA) is funding this program</li> <li>NYSERDA receives funding primarily from the ratepayer-supported System Benefits Charge collected by investor-owned gas and electric utilities</li> </ul>	<ul style="list-style-type: none"> <li>Building Operations and Maintenance</li> <li>Energy Efficiency and Clean Technology</li> <li>Offshore Wind Workforce Training and Skills Development</li> <li>Climate Justice Fellowship</li> <li>Clean Energy Internship</li> <li>On-the-Job Training</li> <li>Pay for Success Clean Energy Training</li> </ul>	Specific funding for disadvantaged communities or priority population (\$300,0000)
Future Energy Jobs Act (IL)	<ul style="list-style-type: none"> <li>\$30M over 12 years</li> <li>Distributes \$3M, \$3M, and \$4M to the 3 programs respectively in 3 delivery years</li> </ul>	<ul style="list-style-type: none"> <li>Funds to come from utility companies</li> </ul>	<ul style="list-style-type: none"> <li>Solar Training Pipeline</li> <li>Solar Craft Apprenticeship Program</li> <li>Multicultural Jobs Program</li> </ul>	Target diverse low-income, minority, or economically disadvantaged populations
Climate and Equitable Jobs Act (IL)	<ul style="list-style-type: none"> <li>\$21M, \$10M, \$6M, and \$21M for the 4 programs respectively each year</li> </ul>	<ul style="list-style-type: none"> <li>An increase of rate-payer bills<sup>17</sup></li> </ul>	<ul style="list-style-type: none"> <li>Clean Jobs Workforce Hubs</li> <li>Illinois Climate Works Preapprenticeship</li> <li>Returning Residents Clean Jobs Training</li> <li>Energy Transition Barrier Reduction</li> </ul>	Focus on equity eligible individuals
Clean Transportation Program (CA)	<ul style="list-style-type: none"> <li>\$100M annually for the whole program</li> </ul>	<ul style="list-style-type: none"> <li>Program leverages private and public investments</li> </ul>	<ul style="list-style-type: none"> <li>Energy Transit Apprenticeship</li> </ul>	Prioritize disadvantaged/low-income

<sup>17</sup> <https://www.newburnlaw.com/analysis-of-the-illinois-climate-and-equitable-jobs-act>



	<ul style="list-style-type: none"> <li>\$1.5M in FY 2021-2022</li> </ul>	<ul style="list-style-type: none"> <li>Funds come from vehicle and vessel registration, vehicles identification plates, and smog abatement fees</li> </ul>	<ul style="list-style-type: none"> <li>Advanced Transportation and Logistics Initiative</li> </ul>	communities, underrepresented populations, and economically disadvantaged high schools
Clean Energy Workforce Development Grant (PA)	<ul style="list-style-type: none"> <li>Approximately \$2,500,000</li> <li>Up to \$500,000 per application</li> </ul>	<ul style="list-style-type: none"> <li>Pennsylvania Department of Labor &amp; Industry</li> </ul>		Requires addressing specific diversity, equity, and inclusion goals to recruit, hire, and retain employees from diverse populations
Massachusetts Clean Energy Center (MA)	<ul style="list-style-type: none"> <li>Up to \$1M per project</li> <li>\$1M for Equity Workforce Training Implementation Grants</li> <li>\$1.2M for MWBE Support Grants</li> </ul>	<ul style="list-style-type: none"> <li>Funding from the Renewable Energy Trust Fund</li> <li>This fund is from a benefit charge of \$0.0005/kWh paid by investor-owned utility ratepayers and municipal electric departments that have opted in</li> </ul>	<ul style="list-style-type: none"> <li>Offshore Wind Works - Workforce Training &amp; Development Grants</li> <li>Equity Workforce Training Implementation Grants</li> <li>Minority- and Women-Owned Business Enterprises (MWBE) Support Grants</li> </ul>	Special funding for training programs with a Diversity, Equity, Inclusion & Justice (DEIJ) focus

## Question 5

### Associated Potential Recommendation:

Provide an incentive or other financial support for commercial buildings complying with BEPS. This requires more input from the Task Force to understand what sort of funding mechanism is desired by the large commercial building sector.

### Question:

Please recommend a tax credit or similar program from another state that could be useful for helping building owners implement efficiency and electrification projects across the commercial, institutional, and multifamily buildings sector.

### Results:

Many states have tax credit options for transitioning to electrification or improving energy efficiency in buildings such as those detailed in the Table 1 below:

**Table 1 Tax Credit Programs**

State	Program	Incentive	Details	Program Cap
Colorado	Heat pump and heat pump water heaters	The tax credit (10%) and sales tax exemption (2.9%) add up to an additional 12.9% discount on the price of the equipment	Not including installation charges. The 10% tax credit and state sales tax exemption also extend to electrical panel upgrades	

New Mexico	Sustainable Building Tax Credit- Installing Energy Efficient Products in Existing Residences	Depends on the product, up to \$3,000	Depends on whether the home is in affordable or non-affordable housing	\$2,900,000
New Mexico	Sustainable Building Tax Credit- Renovation and new construction	Residential/commercial building credit depends on square footage, level of certification, LMI status	Depends on whether the home is in affordable or non-affordable housing	\$4,250,000
South Carolina	Energy Efficient Manufactured Homes Tax Credit	\$750 tax credit	an individual must purchase either: 1) a manufactured home that meets or exceeds the U.S. Environmental Protection Agency's and the U.S. Department of Energy's energy-saving efficiency requirements; or 2) a manufactured home that meets or exceeds energy efficiency requirements under the ENERGY STAR program. ends June 2024	

There are additional incentive programs, outside of tax credits, focused on transitioning to electrification or improving energy efficiency in buildings such as those detailed in Table 2 below:

**Table 2 Additional Fund Types for Implementing BEPS**

State	Program	Incentive	Details	Program Cap
Washington D.C.	<a href="#">Sustainable Energy Trust Fund: DC Green Bank</a>	<i>Varies by applicant</i>	Fund supports financing for solar energy, greener and more efficient buildings, infrastructure resilience, and transportation electrification	\$70 million
Washington D.C.	<a href="#">Sustainable Energy Trust Fund: Affordable Housing</a>	<i>Varies by applicant</i>	Funding to support affordable housing compliance with BEPS	\$3 million
California	<a href="#">BUILD Incentives</a>	\$150/metric ton CO2 for GHG incentive, \$100,000 for new adopters, max \$2 million per applicant	BUILD incentives are based on a project's anticipated modeled greenhouse gas (GHG) emission reduction as compared to the mixed-fuel 2019 Energy Code prescriptive standards.	\$80 million <sup>18</sup>
Washington	<a href="#">Early Adopter Incentive Program</a>	\$0.85/gross square foot	One-time payment for eligible building owners excluding parking, semi-conditioned, or unconditioned spaces. This rebate is paid out after BEPS compliance is achieved.	\$75 million

<sup>18</sup> This is the program budget rather than a program cap. The program is funded by revenue generated from the GHG emission allowances, so there is no hard cap, but an anticipated budget of \$80 million.

## Question 6

### Associated Potential Recommendation:

The Maryland Department of Labor should work with the MEA, large and small employers, schools, community colleges, training programs, nonprofits, and labor unions to establish and provide long-term subsidies to pre-apprenticeship pathway programs that have formal relationships or agreements with registered apprenticeship programs: 1) that are targeted at providing the skills needed to decarbonize buildings, including electric upgrades, installing heat pumps, induction stoves and other highly-efficient electric technologies and 2) that meet state and federal requirements including the section 179D and 45L tax deductions and other tax incentives in the Inflation Reduction Act (IRA).

### Question:

Can you estimate the budget Maryland would need to implement this recommendation using precedents from other states?

### Results:

A pre-apprenticeship pathway program in Maryland designed to develop skillsets needed to decarbonize buildings is estimated to require about \$7.8 million in funding. This analysis was based on funding to the similar Illinois Climate Works Pre-Apprenticeship program, which is funded through an increase of rate-payer utilities.

### Analysis:

Illinois' CEJA program has four workforce development components with the following funding amount per year<sup>19</sup>:

- *Clean Jobs Workforce Hubs*: Workforce hubs across the state run by community-based organizations provide clean jobs training and a career pipeline for equity eligible individuals. Does not advance trainees to registered apprentice programs.<sup>20</sup> \$23M in funding per year.
- *Illinois Climate Works Pre-Apprenticeship*: Trains equity eligible individuals for careers in clean energy sector construction and building trades. Moves trainees to registered apprenticeship programs. \$10M in funding per year.
- *Returning Residents Clean Jobs Training*: Trains soon-to-be-released people who are incarcerated for jobs in the solar and efficiency. Does not advance trainees to registered apprentice programs. \$6M in funding per year.
- *Energy Transition Barrier Reduction*: Provides resources for publicity, placement, and retention to break down barriers to participation in training programs. \$21M in funding per year, of which \$15M per year is allocated for Clean Jobs Workforce Hubs and \$6M per year is allocated for the Illinois Climate Works Pre-Apprenticeship program.

The Illinois Climate Works Pre-Apprenticeship program places trainees into apprenticeship programs eligible for IRA tax incentives. Therefore, this program is the most appropriate precedent for comparison to support the Task Force recommendation for Maryland.

The total funding for the Illinois Climate Works Pre-Apprenticeship program is \$10M for the actual program plus another \$6M from the Energy Transition Barrier Reduction fund for additional support. The total funding amount is thus \$16M per year. The funding source for this program is through an increase of rate-payer utilities.

If we normalize these costs based on the ratio of population between Illinois and Maryland, then the estimated cost for a similar program in Maryland is \$7.8M per year.

<sup>19</sup> <https://dceo.illinois.gov/ceja/ceja-workforce-training.html>

<sup>20</sup> [https://dceo.illinois.gov/content/dam/soi/en/web/dceo/ceja/documents/il-clean-jobs-training-program-inventory\\_032823.pdf](https://dceo.illinois.gov/content/dam/soi/en/web/dceo/ceja/documents/il-clean-jobs-training-program-inventory_032823.pdf)

## Additional Examples of Workforce Development Programs:

For additional references for workforce development programs, the table below comes from Question 4 of our Task Force Recommendations Analysis. This table includes examples of workforce development programs that are related to building decarbonization and other clean energy jobs.:

Relevant Program/Regulation	Funding Amount	Funding Source	Workforce Development/Training Programs	Equity/Justice
Clean Energy Workforce Development and Training (NY)	<ul style="list-style-type: none"> <li>\$120M through 2025</li> <li>With funding caps for each program and its selected projects</li> </ul>	<ul style="list-style-type: none"> <li>New York State Energy and Research Development Authority (NYSERDA) is funding this program</li> <li>NYSERDA receives funding primarily from the ratepayer-supported System Benefits Charge collected by investor-owned gas and electric utilities</li> </ul>	<ul style="list-style-type: none"> <li>Building Operations and Maintenance</li> <li>Energy Efficiency and Clean Technology</li> <li>Offshore Wind Workforce Training and Skills Development</li> <li>Climate Justice Fellowship</li> <li>Clean Energy Internship</li> <li>On-the-Job Training</li> <li>Pay for Success Clean Energy Training</li> </ul>	Specific funding for disadvantaged communities or priority population (\$300,0000)
Future Energy Jobs Act (IL)	<ul style="list-style-type: none"> <li>\$30M over 12 years</li> <li>Distributes \$3M, \$3M, and \$4M to the 3 programs respectively in 3 delivery years</li> </ul>	<ul style="list-style-type: none"> <li>Funds to come from utility companies</li> </ul>	<ul style="list-style-type: none"> <li>Solar Training Pipeline</li> <li>Solar Craft Apprenticeship Program</li> <li>Multicultural Jobs Program</li> </ul>	Target diverse low-income, minority, or economically disadvantaged populations
Climate and Equitable Jobs Act (IL)	<ul style="list-style-type: none"> <li>\$23M, \$10M, \$6M, and \$21M for the 4 programs respectively each year</li> </ul>	<ul style="list-style-type: none"> <li>An increase of ratepayer bills<sup>21</sup></li> </ul>	<ul style="list-style-type: none"> <li>Clean Jobs Workforce Hubs</li> <li>Illinois Climate Works Preapprenticeship</li> <li>Returning Residents Clean Jobs Training</li> <li>Energy Transition Barrier Reduction</li> </ul>	Focus on equity eligible individuals
Clean Transportation Program (CA)	<ul style="list-style-type: none"> <li>\$100M annually for the whole program</li> <li>\$1.5M in FY 2021-2022</li> </ul>	<ul style="list-style-type: none"> <li>Program leverages private and public investments</li> <li>Funds come from vehicle and vessel registration, vehicles identification plates, and smog abatement fees</li> </ul>	<ul style="list-style-type: none"> <li>Energy Transit Apprenticeship</li> <li>Advanced Transportation and Logistics Initiative</li> </ul>	Prioritize disadvantaged/low-income communities, underrepresented populations, and economically disadvantaged high schools
Clean Energy Workforce Development Grant (PA)	<ul style="list-style-type: none"> <li>Approximately \$2,500,000</li> <li>Up to \$500,000 per application</li> </ul>	<ul style="list-style-type: none"> <li>Pennsylvania Department of Labor &amp; Industry</li> </ul>		Requires addressing specific diversity, equity, and inclusion goals to recruit, hire, and retain employees

<sup>21</sup> <https://www.newburnlaw.com/analysis-of-the-illinois-climate-and-equitable-jobs-act>

				from diverse populations
Massachusetts Clean Energy Center (MA)	<ul style="list-style-type: none"> <li>• Up to \$1M per project</li> <li>• \$1M for Equity Workforce Training Implementation Grants</li> <li>• \$1.2M for MWBE Support Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Funding from the Renewable Energy Trust Fund</li> <li>• This fund is from a benefit charge of \$0.0005/kWh paid by investor-owned utility ratepayers and municipal electric departments that have opted in</li> </ul>	<ul style="list-style-type: none"> <li>• Offshore Wind Works - Workforce Training &amp; Development Grants</li> <li>• Equity Workforce Training Implementation Grants</li> <li>• Minority- and Women-Owned Business Enterprises (MWBE) Support Grants</li> </ul>	Special funding for training programs with a Diversity, Equity, Inclusion & Justice (DEIJ) focus