Mitigation Work Group
Buildings Ad Hoc Group

August 20, 2020

Meeting Notes
Meeting began at 3:00pm.

Attendees: Chris Hoagland, Cindy Osorto, Allison Maginot, Abdulrahman Mohammed, Aaron Greenfield, Bryan Howard, David Giusti, David Smedick, David St. Jean, Dean Fisher, Emily Curley, Eric Coffman, Helen Walter-Terrinoni, Jamal Lewis, James Grevatt, Jessie Keller, John Mayernik, John Patrick O'Neill, Kenneth Schisler, Kirsten Jackson, Lori Graf, Maggie Molina, Maria Frazzini, Mark Stewart, Michael Powell, Peter Trufahnestock, Richard Louis, Stephen Burr, Stephen Holcomb, Susan Casey, Susan Miller, Thomas Walz, Tom Ballentine, William Ellis, Stephen Burr, Ryan Opsal, Julian Varo, Liz Feigner, John Fiastro, Ellen Valentino, Ruth White, Caitlin Madera, Christopher Russell

- **Welcome and Introduction** by Chris Hoagland, Climate Change Program Manager at Maryland Department of the Environment (MDE), and Mark Stewart, Buildings Ad Hoc Group Facilitator and Sustainability Manager at the University of Maryland
    - Mark Stewart: This is the penultimate meeting. The draft recommendations will be discussed at the following meeting.
- **Heating System Economics** - Jack Mayernik, Building Energy Analyst at DOE
    - Analysis by the U.S. Department of Energy (DOE) found that it is currently less expensive for 99% of homes with propane, 95% of homes with oil, and 20% of homes with natural gas space heating systems in Maryland to switch to an efficient air source heat pump (ASHP) at the point of air conditioning (AC) system replacement. DOE analysis also suggests that for roughly half of Maryland homes with both an AC unit and natural gas furnace near the end of their lives, switching to an ASHP would be cost effective.
    - One NREL study shows the national percentage of homes passing cost-effectiveness thresholds of furnace/air conditioner with variable-speed heat pumps under wear-out scenarios. The study shows that when an air conditioner wears out, switching to a highly efficient air source heat pump from propane and oil is extremely cost-efficient.
    - Electricity is estimated to be 3.3-3.4 times more expensive in kBtu in Maryland compared to the country.
        - The costs today are not the only thing that matters. Future costs also matter.
        - More variation is expected in 2050.
        - Electricity prices decrease in 2050 but nat gas prices may rise by at least 10%.
    - More efficient buildings can sometimes reduce the size of equipment needed, which may be related to equipment costs.
    - DOE developed method for furnace efficiency.

        - With heat pumps, there's rapid development to technology advancement and there's wide range of performance.
        - Takeaway: it's almost always cost effective in 100% electric new construction to have electrified heat pump installations replace propane and oil systems.

- **Beneficial Building Electrification in Maryland** - Maggie Molina, Senior Director for Policy at ACEEE
    - Synergies of building electrification and energy efficiency
        - Reduces energy consumption (total source Btus), lowers customer costs, and reduces GHGs.
        - Can compliment existing energy efficiency programs.
        - Building shell and efficiency measures can be designed to reduce energy demand and can provide load flexibility benefits.
    - Policy and program trends
        - ACEEE profiled 23 heat pump programs with budgets up to $110 million, which usually encourage or require weatherization to reduce high loads.
        - Existing programs emphasize residential sector.
        - Some programs encourage all-electric new construction.
        - Fuel switching rules also have begun to evolve among various states.
    - Economics of building electrification
        - ACEEE Analysis on Consumer Economics for residential heat pumps
        - Most of the country sees positive lifestyle cost savings from converting a propane furnace to a heat pump at the time of equipment replacement.
        - Cost-effective now relative to propane and oil.
        - Target programs to customers can be appropriate, such as underserved communities or areas associated with high carbon impacts
        - Residential heat pumps provide lifestyle cost savings at the time of replacement.
    - Recommendations
        - Incorporate equity at beginning of policy and program discussions.
        - Encourage beneficial building electrification.
        - Technology options and customer applications.
        - Electrification equipment programs.

EmPOWER: Present - Amanda Best, Senior Commission Advisor at Public Service Commission (PSC)

- Maryland Public Service Commission – oversees EmPOWER programs and regulates rates.
- Energy Efficiency in MD
    - History of the EmPOWER Maryland Energy Efficiency Act of 2008
    - EmPOWER Programs
        - Commercial and Industrial Programs are included in EmPOWER
        - Building tune-up program – optimizes existing appliances, rather than replacement.

        - Limited Income Programs are managed by the Department of Housing and Community Development (DHCD), including the Low Income Energy Efficiency Program (LEEP).
        - Demand Response and various other Programs, like streetlight upgrades and transmission and distribution upgrades.
    - Historic Performance
        - Saved a total of 10,670,600 MWh and 2,571 MW of peak demand.
        - Spent $3.1 billion since 2009 including $2.3 billion on energy efficiency programs and $814 million on demand response programs.
        - For the average residential customer using 1,000 kWh per month, the 2020 EmPOWER surcharge ranges between $5.63 and $8.30 depending on the utility.
    - Benefits of Energy Efficiency
        - For every $1 spent, the EmPOWER programs generate approximately $1.22 in benefits.
        - Expected savings of $10.6 billion since program inception.
        - Benefits to all ratepayers are the system-wide benefits and societal benefits.
    - EM&V
        - The Commission uses the Total Resource Cost Test and the Societal Cost Test to determine if the EmPOWER programs are cost-effective.
        - More information can be found in the PSC website.
        - Non-electric benefits by program.
            - All the programs included air emissions considerations.
    - Upcoming milestones
        - Utilities and DHCD file plans for 2021-2023 by September 1, 2020 with Commission Order pertaining to plans by December 31, 2020.
        - Commission is required to file recommendations to the General. Assembly on future goals and cost-effectiveness testing beyond 2023 by July 1, 2022.
    - Statutory Limitations: PUA §7-211 (i)(1)(i-iv)
        - EmPOWER has been an energy savings program – a kw not used is the most efficient path, this made sense when there were energy reliability concerns.
        - Fuel switching has not been allowed in Maryland historically since it would involve collecting funds from existing customers.
    - Future pathways may include statutory changes, PSC decisions, new program design, and stakeholder feedback.

EmPOWER: Future - Jim Grevatt, Managing Consultant at Energy Futures Group

- Introduction to Energy Futures Group, a consulting firm based in Vermont and with energy efficiency expertise.
- How can EmPOWER be utilized to advance building decarbonization?
    - Integration of climate and utility energy efficiency considerations.
- The 2019 Draft Greenhouse Gas Reduction Act Plan mentions to begin increasing incentives for deployment of efficient electric heat pumps.
    - Sierra Club comments: “The state should, at minimum be aiming for a complete decarbonization of the building sector by 2050” and increase electrification of existing houses.

- EmPOWER programs have many benefits.
    - Saving energy.
        - Reducing loads is critical cost component and impacts infrastructure investments.
        - In some jurisdictions (NY, MA) electrification is justified by reducing site Btu.
    - Improving building performance.
        - Reduced operating and maintenance costs.
        - Improved comfort.
        - better air quality.
    - Increase demand for products through awareness and incentives.
    - Builds capacity.
        - Design and technology training.
        - Workforce development.
        - Demonstration projects.
    - Actions can be taken in both the current framework and through legislation to direct utilities to align with climate goals.
    - EmPOWER framework
        - Requires reporting of avoided carbon starting in 2021-2023.
        - Maximizes efficient retrofit of existing electric end uses.
        - Authorizes technical trainings on electrification technology and design.
        - Authorizes demonstration projects and pilot projects.
        - Authorizes utilities to fuel-switch “dirty fuels” for heat and hot water to heat pumps.
            - Clear statutory language would be helpful for cost-benefit analysis discussions.
    - Demonstration: San Joaquin Valley in California showed that an air quality benefit in low-income community when heat pumps were used instead of propane and wood.
    - All-electric new construction and renovation tiers to support 2025 code.
    - Utilities like to have specific direction, just like regulated agencies like specific direction from statute.
    - The General Assembly could:
        - Change primary metric from avoided kWh to avoided carbon and,
        - Direct PSC to pursue all cost-effective energy efficiency and electrification based on value of avoided carbon.
    - The state should go all electric and pursue a do no harm approach: prohibit gas equipment incentives but allow building shell improvements.

- **Discussion** - All
    - Mark Stewart mentioned that many states are looking at building decarbonization and encouraged the group to consider other state efforts for Maryland’s planning efforts.
    - Emily Curley (Montgomery Department of Environmental Protection) - do we know what percentage of households in MD might have propane or oil heating?
    - Mark S.: In MDE’s GHG model it’s roughly 9% oil and 3% propane.

- Tom Ballentine (NAIOP) said he was interested in learning more about the case study pertaining to commercial electrification.
- Ellen Valentino (Mid-Atlantic Petroleum Distributors Association) said she is interested in whether the subgroup is looking at California's recent electricity issues.
- Thomas Walz (DHCD) Particularly for the low income suite of housing stock. Do you recommend housing stock level review of cost effective test for the program evaluation?
- Christopher Russell (MEA) mentioned that it is important to consider the costs of natural gas distribution abandonment that may accrue for consumers.

- **Final Steps** - Mark Stewart - Thank you everyone for joining. The next meeting (Sept. 3) will be our last. We will discuss our recommendations to the Mitigation Work Group (MWG).

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