

**Mitigation Work Group
Buildings Ad Hoc Group**

Topic: Discussion of Draft Building Energy Transition Plan

Meeting Notes
September 16, 2021

Attendees: Abdulrahman Mohammed, Amneh Minkara, Andrew Kent, Andrew Sand, Ashita Gona, Caitlin Kerr, Charles Li, Chris Parks, Christopher Beck, Christopher Russell, David Giusti, David Lapp, David Smedick, David Lapp, David St. Jean, Dean Fisher, Donald Goldberg, Erick Thunell, Edward Lukemire, Emily Curley, Eric Coffman, Emily Curley, Erin Appel, Geri Nicholson, Jamal Lewis, James King, Jennifer Gallichio, Katie Thomas, Kim Coble, Kimberlee Drake, Kinga Hydras, Klaus Philipsen, Lance Davis, Les Knapp, Lorig Charkoudian, Margie Brassil, Mark Beck, Mark Stewart, Michael Powell, Nick Harbeck, Richard Louis, Richard Mallory, Ruth White, Ryan Schwabenbauer, Thomas Marston, Thomas Walz, Tom Ballentine, Travis Mullins, Vimal Amin, William Ellis

Introduction

- Mark Stewart: Thank you everyone for joining the call. Today we will be discussing the draft energy transition plan and will get some updates from E3 on their building analysis based on recent comments received.

Update on the Maryland Building Analysis

Presentation by Charles Li, Managing Consultant at Energy and Environmental Economics

- E3 has made a few updates to the Maryland Building Decarbonization Plan based on comments received by this group as well as the Mitigation Work Group, including:
 - Estimated GHG emissions from methane leakage for each scenario
 - Corrected an error in the electric system cost estimate
 - Adjusted the equipment cost for the High Electrification with Improved System Configuration case to reflect larger tonnage for heat pumps
 - Conducted a climate impact sensitivity analysis
- All modeled scenarios would achieve zero direct building emissions by 2045 through electrification, efficiency improvement, and use of low-carbon fuels
- Indirect emissions from methane leakage may still be possible from in-state pipelines
- Electrification with fuel backup has continued to show to be the lowest-cost scenario among the three scenarios modeled
 - In addition to lowest cost, this scenario is showing that it is the lowest risk path as well
 - The climate impact analysis did not have large changes in the total resource cost projections and the electrification with fuel backup scenario remained the most cost effective option
 - The climate impact analysis increased buildings with AC from 94% to 100%, which causes heating demand to slightly decrease and cooling demand to increase. It's

assumed that weather temperatures increases

Discussion on Updates

- Donald Goldberg: There is a question of sequencing in terms of what systems should be installed in residential buildings. Heat pumps take up space and there may sometimes be a need for there to be two systems.
- Thomas Marston: There is a reversing valve in both air conditioning and heat pumps, but there is not always a need for more space for heat pumps.
- Mark Stewart: There are different building types and technology applications may vary. There would not be an additional space requirement when the heat pump is replacing the AC unit
- David Smedick: Which global warming potentials (GWP) were used for the methane leakage estimates?
 - Charles: The 100-year values under the Fifth Assessment Report (AR5)
- Delegate Lorig Charkoudian: I have a lot of questions regarding reducing peak loads. Are you assuming smart meters?
 - Charles Li: There needs to be price signals within the system to encourage decarbonization and a variety of technologies can be used, including smart meters
- Thomas Marston: There has been a lot of building growth in the DC and Baltimore area and buildings range in age and construction type. Government will be faced with some tough choices in the future, including pertaining to multifamily buildings and more efficient long-term planning
 - Charles: study is representing average building type from the Commercial Buildings Energy Consumption Survey (CBECS)
 - Tom: should really consider incentivizing redevelopment
- Lance Davis: There is an embodied carbon component that could also be considered
- Mark Stewart: The current rate structure is currently portrayed in the analysis, but this also has the potential to change outcomes in the future
- Ellen Valentino: I'm having trouble understanding the residential numbers. The average home would need two systems.
 - Mark: One typical scenario is a home with central air conditioning. System can be replaced with a more efficient system at the end of life. There is also non-centralized systems that could use mini split heat pumps. There are also new window heat pumps that are coming into the market that with time may become more affordable. As homes upgrade over time, they can replace their systems with heat pumps.
 - Ellen: It's important to get the math right. If a home will need two systems, it will make the consumer economics more expensive.
 - Mark: We are not talking about mandates in our policy proposals. We are talking about incentivizing.
- Donald Goldberg: Recommendation 2C sounded like a gas furnace should be replaced by another gas furnace and I don't think this makes any sense
 - Mark: Replacement or hybrid solution economics will vary by building type.
- Donald Goldberg: In 2035, could the market signals that we are contemplating move towards keeping customers within the gas system? There is a lot of complexity
 - Mark: One of the most important recommendations included in the policy proposal is recommendation 5. How do we avoid leaving gas customers behind? We cannot answer



this question today or within this forum.

- David Smedick: There should have been more details pertaining to building shell improvements in the electrification with fuel backup scenario, since this could drive up cost projections
 - Charles: There is a wide cost range of shell improvement measures and the analysis included a screening of whether it makes sense for different customers to make shell improvements
 - For mixed fuel customers it makes sense because it saves money on fuel
 - For full electric customers it helps to avoid peak winter costs
 - For the fuel with backup scenario the peak cost is already addressed by the fuel backup, so shell improvement isn't as cost effective

Discussion on Draft Energy Transition Plan

- Mark Stewart: A few of the comments received for policy recommendation 1 (adopt an all-electric construction code) mentioned the date in which the new electric code would be implemented
 - Thomas: It takes a while for code to be implemented by Maryland after new codes are proposed by the IECC. The earliest that new electric code would be implemented would be 2027.
- Tom B: There is not an off the shelf all-electric IECC code that can achieve this. There are debates on what cost effectiveness means. There should be a separate rulemaking process.
- David Smedick: We supported the 2024 timeline but we see opportunities for code changes. A lot of the technical analysis is supporting electrification and new construction being electric is a common theme.
 - More definition should be provided pertaining to cost effectiveness tests including more climate considerations.
- Ellen Valentino: I don't understand the math and the energy for this recommendation. The 2024 timeline is not achievable. The renewable fuel piece is not fully addressed.
 - Mark: Oil and propane has higher carbon intensities, and that is also an important consideration.
 - Ellen: Biofuels may be more environmental advantageous
- Travis Mullins: Do we have any idea of how many residential homes have all-electric? A lot of suburban and rural communities seem to have all electric.
 - Mark: I don't have this information but my team will look into it.
 - Thomas: ICF would have this information. It's tending to be an affordable market to build all-electric.
- Lorig Charkoudian: EVs will affect our peak loads and what infrastructure will have to look like, including by having impacts on peak load
- Mark: Low carbon fuel will be expensive. How do we plan to this transition of consideration of low carbon fuel inclusion for the future?
- Ellen: If it's very cold, then we will need a backup system
 - Mark: Total system cost is the true question, not reliability or ability for a heat pump to sufficiently heat
 - Ellen: A heat pump can fail when it is really cold, we both agree that resiliency and cost effectiveness are important considerations

- Jamal Lewis: I would like to say that GHHI thinks that the transition plan does not emphasize equity for households in historically underserved, under-represented, and excluded communities. To achieve an equitable transition it is important that there is a comprehensive and aligned approach that includes resources for weatherization and pre-weatherization to address barriers to decarbonization and electrification as well as limit energy cost burden. Here is a report that we just published that highlights some strategies for achieving an equitable transition. <https://www.greenandhealthyhomes.org/publication/leading-with-equity-and-justice-in-the-clean-energy-transition/>
- David Smedick: In our comments, we raised concerns on the clean heat standard on how it is currently drafted. The language should better align with the Colorado program. We recommend not moving forward as it is currently drafted.
 - Mark: We can likely better integrate the Colorado program language.
- Mark: The MWG will be meeting on Tuesday to discuss the current draft plan. We will be updating the plan prior to this upcoming meeting to better reflect the comments received.
- Mark: The building performance standard recommendation was meant to be as flexible and cost-effective as possible
- Donald Goldberg: There must be a compliance assessment. I wanted to point out that Delegate Stewart in a previous bill proposed a noncompliance payment that would have to be more than the cost of compliance.
- Emily: There are some tradeoffs to what is currently proposed. There are cities that have established building performance standards and those can be used as models
- Tom B.: You have the potential to put some products out that are less safe and less quality products.
- David: Are we considering social cost of carbon? Especially with consideration of equity considerations
- Richard Mallory: Was there anything about certified natural gas?
- Donald: Are considering the phase out of inefficient appliances? E3 study didn't include health and safety costs, including childhood asthma. We should likely get rid of gas cooking for safety concerns.
- Travis: I'm against electrification standards at this point. There are current assumptions about utilities using renewable energy. Right now, electric resistance heating is more expensive than gas. There is vast uncertainty given that we haven't achieved full renewable energy. A building isn't fully net zero if the electricity isn't coming from a renewable source
 - Mark: There are indirect emissions that we recognize exist.
- Michael Powell: This is not one plan for the next 45 years that is set in stone. This is an iterative process and may change over time. This is a serious effort, but we will likely need the ability to adjust.
- Kim Coble: Thank you for the collegial process. The long term perfect shouldn't be the enemy of the short-term goals that we are trying to propose. We will need to be patient about the process and recognize that recommendations will likely change over time and with feedback from the General Assembly.
- Mark: MWG meeting on Tuesday will have a focus on the Plan. This may be the final meeting of this ad hoc group. We will keep the group informed. On November 1st, there will be a general MCCC meeting and on November 15th, the final MCCC report will be released.

