Metropolitan Washington Council of Governments

BUILT ENVIRONMENT AND ENERGY ADVISORY COMMITTEE (BEEAC)

Draft Webinar Meeting Summary: November 19, 2020

BEEAC Members in Attendance:

- Gina Mathias, City of Takoma Park (Chair)
- Bill Eger, City of Alexandria (Co-Vice Chair)
- Ashleigh Armentrout, City of Bowie
- Dawn Ashbacher, Frederick County
- Mati Bazurto, City of Bowie
- Amanda Campbell, City of Rockville
- Ellen Eggerton, City of Alexandria
- Beth Groth, Charles County
- Jenn Hatch, DOEE
- Dawn Hawkins-Nixon, Prince George's County
- Sandy Hunter, Loudoun County
- Joan Kelsch, Arlington County
- Chris McGough, Fairfax County
- Kevin Milsted, Prince William County
- Charles Njoku, Arlington County
- Hamid Omidvar, Montgomery County
- Kate Walker, City of Falls Church

Additional Attendees:

- Kathleen Berube, DOEE
- Franklin Bourdeau, Prince George's County
- Kim Cheslak, New Buildings Institute
- Eric Coffman, MEA
- Tom Deyo, Montgomery County Green Bank
- Lisa Goldberg, City of Alexandria
- Stephen Gyor, District of Columbia
- Adriana Hochberg, Montgomery County
- Kristian Hoffland, DOEE
- Savannah Kleeman, American University
- Meghan Lewis, Carbon Leadership Forum
- Stephen Morel, Montgomery County Green Bank
- Nathalie Owen, Fairfax County
- Luisa Robles, City of Greenbelt
- Jennifer Wolf, Sustainable Building Partners
- Edward Yim, DOEE

COG Staff:

- Leah Boggs, COG DEP
- Maia Davis, COG DEP
- Katie Dyer, COG DEP
- Jeff King, COG DEP
- Wyetha Lipford, COG DEP
- Tim Masters, COG DEP
- Stephen Walz, COG DEP

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1. CALL TO ORDER AND INTRODUCTIONS

Gina Mathias, City of Takoma Park (BEEAC Chair)

Chair Gina Mathias called the meeting to order.

2. APPROVAL OF THE SEPTEMBER 17 MEETING SUMMARY

Gina Mathias, City of Takoma Park (BEEAC Chair)

The September 17 BEEAC Meeting Summary was approved.

3. COG ANNOUNCEMENTS AND UPDATES

A. 2021 BEEAC Survey

Leah Boggs, COG

Since 2015, COG staff have conducted an annual survey to gauge member priorities for the year. COG staff use that data to inform what BEEAC should focus on for the year, and interface with CEEPC priorities. This year, the survey includes an additional set of questions regarding non-utility fuel use. Staff have completed greenhouse gas (GHG) emission inventories for 2005, 2012, 2015 and 2018. The next inventory year is 2020. COG staff are collecting the local fuel use data to ensure more accurate inventories and GHG emissions reporting. The due date for the survey is December 18.

B. CEEPC Plan Adoption

Maia Davis, COG

The 2030 Regional Climate and Energy Action Plan was adopted by CEEPC yesterday. Prior to this, the COG Board had to approve and adopt the 2030 goals that were recommended by BEEAC, ACPAC, and CEEPC. The COG Board approved those goals, as well as the Transportation Planning Board (TPB). The adopted goals include a 50 percent GHG emission reduction by 2030 and to work towards being a climate resilient region. Climate change is one of the top priorities for TPB now.

C. Contribution Analysis and Jurisdictional GHG Inventory Fact Sheets

Tim Masters, COG

In 2019, COG members received community-wide GHG emission inventory fact sheets, which included an emissions summary, background information and information related to the inventory methodology. It also included a bar chart that compared inventory years 2005, 2012 and 2015. This year, COG staff have completed the 2018 inventory and will be sending out updated fact sheets to COG's local jurisdictions. COG will send out a template of this fact sheet for feedback before finalizing each jurisdiction's final fact sheet. Alongside this, COG staff will also send out a contribution analysis, previously called the Drivers of Change model. There is a regional version of this in the plan that was adopted yesterday. The summary of the contribution analysis includes a waterfall chart, which shows a breakdown of the factors that contributed to decreases and increases in GHG emissions between two inventory years. COG asks for feedback on these items by December 18. Thereafter, COG will update these and send out final versions early next year.

4. JURISDICTION UPDATES AND PEER EXCHANGE

Local government members highlighted energy and building-related events, projects and programs. Members were asked to discuss:

- What barriers have been encountered in assessing and benchmarking value chain impacts

and embodied carbon in their jurisdiction's building stock?
- What practices has their jurisdiction adopted that supports embodied carbon reductions in the building stock?

Gina Mathias, City of Takoma Park
Takoma Park has not assessed embodied carbon in their building stock and hope to learn more today.

Hamid Omidvar, Montgomery County
Montgomery County has concentrated mostly on net zero buildings and carbon reduction has been their main focus. They have not been able to effectively measure embodied carbon in the materials that are used in their buildings. This requires more planning. They have found that it is not easy obtain that kind of information because manufacturers do not offer that information. It has been four years now that the county has been calculating and tracking the carbon footprint of their 400 buildings. The county has great data from their buildings, but not with regard to the material carbon footprint.

Dawn Hawkins-Nixon, Prince George's County
Prince George's County has done very little regarding decarbonization of county facilities. However, their sustainable energy program has helped expand solar energy usage at county facilities. The county is moving in the direction of utilizing more renewable energies, reducing carbon emissions, and improving energy efficiency through their HVAC systems.

Dawn Ashbacher, Frederick County
Frederick County has done very little with regard to embodied carbon and hope to learn more today.

Mati Bazurto, City of Bowie
The City of Bowie has also done very little regarding embodied carbon. They have worked on solar energy deployment and are looking towards the County for further direction on these topics.

Tom Deyo, Montgomery County Green Bank
Regarding renewable energy, the Green Bank is focused highly on supporting these activities. They recently released their Clean Energy Advantage Ownership Program, which was done in conjunction with the County's solar co-op program. They are also in the midst of putting out a commercial solar PPA to offer to non-profits and for-profits in the County.

Franklin Bourdeau, Prince George's County
Prince George's County have completed engineering one megawatt of solar on county buildings so far. Over the next two years, the county plans to install an additional four megawatts of solar on their properties. They also have $7,500 for residents to install solar on their homes via their solar grant program. They also have their solar PV grant, which provides $10,000 to residents and allows Washington Gas customers to install solar water heaters on their properties.

Beth Groth, Charles County
Charles County has not measured embodied carbon. They are looking into larger scale solar projects to reduce energy emissions and reliance on coal.

Amanda Campbell, City of Rockville
The City of Rockville has not measured embodied carbon. The city has done some energy efficiency projects, and they performed energy audits years ago, but there is a lot more to be done on energy efficiency and renewable energy. The city recently had an open house regarding their action plan

development, and the concept of embodied carbon was raised, specifically in reference to concrete.

Kathleen Barube, DOEE
The District has been focused on operational carbon with regard to their Building Energy Performance Standards (BEPS). DOEE has started to think more about embodied carbon with their Carbon Neutrality Strategy. They are in the middle of developing an RFA that will look at both net zero energy design and life cycle assessments (LCA) for a few projects to assess their embodied carbon. The hope is to get the private sector more comfortable and familiar with life cycle assessments and also to give DOEE a baseline understanding of what comes out of a life cycle assessment and what a typical building project might look like.

Kristian Hoffland, DOEE
Earlier in the summer, DOEE looked at the US building code cycle, which included provisions for mass timber. There have been a number of mass timber buildings constructed in the District with CLT and structural timber, without using concrete and steel, which provides a big benefit. There have been some developers inquiring about doing tall timber buildings (up to eight or nine stories high), which is proposed in the 2021 codes. DOEE is looking into adopting this into their codes as they work with those developers. DOEE is also looking into ways to incentivize lower embodied carbon techniques and practices with lower global warming potential. The one-click LCA and the CNCA have proposed 52 policy frameworks that cities can undertake for addressing embodied carbon. DOEE is looking into which of those policies they can realistically enforce and which ones would be best to implement first, and how they would fit into their climate plan.

Edward Yim, DOEE
Adding to the issue of building energy supply and embodied carbon, not all clean energy is equal, especially from a carbon perspective. Local generation should be clean generation to have a lower embodied carbon footprint than inputted clean generation. Even amongst inputted clean generation, there may be different embodied carbon footprints based on what is required to build those facilities. A good example would be onshore wind versus offshore wind. In order to construct offshore wind, it requires a diesel or gas/oil-fired ship has to be in the middle of the ocean for months at a time, which increases the embodied carbon footprint of that facility. These are the kinds of things that will also need thought as the region discusses net zero energy buildings. It may be worthwhile to build out a preference rank of lowest form of carbon-intensive, clean energy; starting with megawatts, energy efficiency and demand response, to local clean generation, and then to inputted clean generation. Helpful distinctions can be made based on that embodied carbon footprint. DOEE is trying to introduce that concept for evaluation of utility projects and programs to the Public Service Commission.

Kevin Milsted, Prince William County
Prince William County has not considered embodied carbon to a large extent and hope to learn more today. Dominion Energy recently rolled out a smart charging infrastructure program, which is something that Prince William County are pursuing on a very small scale to begin installing electric vehicle charging stations at three of their buildings, using the incentives provided by the program.

Bill Eger, City of Alexandria (BEEAC Co-Vice Chair)
The City of Alexandria is thinking about embodied carbon at a very philosophical level. Earlier this year, the city hosted some education sessions for various building staff, specifically on embodied carbon issues. That presentation, provided by Bill Updike, is recorded and available on the city's website. The city has also had preliminary discussions regarding their current building policy, but are not considering embodied carbon at this point. Currently, there is no clear regulatory enforcement mechanism to

incorporate this into building codes, but there is discussion on how to address more advanced topics, be it within the material space or the embodied carbon of the city's electricity supply, both at the site and grid scale.

Kate Walker, City of Falls Church
The City of Falls Church has not adopted anything with regard to embodied carbon, but hopes to learn more today.

Charles Njoku, Arlington County
Arlington County has not done much in with regard to embodied carbon and look forward to learning more today. The county has a large scale VPPA solar project underway to get government operations to 50 percent renewable energy by 2022 and 100 percent by 2025. This is in partnership with Amazon and Dominion Energy.

Chris McGough, Fairfax County
Fairfax County approaches this problem from a different perspective, which might be interesting to the group. Their work is specific to government owned buildings, but they have been working on engaging with their suppliers to do a rigorous CSR assessment, which includes many questions across the sustainability spectrum. Construction spend is a large part of the county's supply chain. The county has scorecards representing $275 million of their annual spend, which will be used as they go to a pool of construction suppliers for projects. The County does not have specific data regarding the GHG emissions related to embodied carbon, but they have opened the door to engagement and created a process by which they can pick and choose suppliers that are working towards these goals and have made improvements to their value chain compared to their peers. So the county plans to give awards based on that measure.

5. NET ZERO ENERGY BUILDING AND DECARBONIZATION SERIES: VALUE CHAIN IMPACTS AND EMBODIED CARBON IN THE BUILT ENVIRONMENT

Meghan Lewis, Carbon Leadership Forum
The Carbon Leadership Forum is a non-profit based out of the University of Washington, Seattle. They provide resources on embodied carbon and have incubated some initiatives such as the C3 tool. Embodied carbon encompasses all the emissions that are embedded in the products that are used to construct the building. This includes raw material extraction, manufacturing, the transport between different project stages and the installation of construction materials onsite. At its simplest, embodied carbon and operational carbon are added together to get the total carbon footprint of a building. There is an important distinction between energy intensity and carbon intensity, which can be differentiated based on the use of energy that results in carbon emissions, and the chemical reactions that happen in the manufacturing of building products that directly creates carbon. About 30 percent of global emissions by sector are from building operations. And another 11 percent at a minimum is from embodied carbon emissions. There are always opportunities to reduce operational carbon. Improvements over a building's life through the replacement of equipment and as the grid becomes cleaner leads to reduced emissions. In contrast, embodied carbon is irreversible once the building has been constructed; there is no way to reduce these emissions. That means reducing emissions needs to take place at the design phase of a project because there will not be an opportunity to fix it later. For the first 10 years of a building's construction, two thirds of the carbon impacts are the embodied carbon, not the operational carbon.

There are three ways to think about the strategies for reducing carbon. First, optimizing the project in

a way that allows the user to reuse building space or use a smaller footprint building. There is also an opportunity for savings. The biggest opportunity to reduce embodied carbon is to not use new materials. Reusing existing materials and reusing existing buildings is paramount. The second way to optimize a project would be to make use of alternative materials. For example, there is a certain amount of evidence that mass timber has a lower carbon impact than concrete or steel. It can also include using an alternate kind of cement within concrete or an alternative to cement. Finally, the shape of the building matters. There are more efficient structures versus less efficient in terms of how much material the engineer has to put into the building to hold it up. At this stage, using whole building life cycle assessment tools is the best way to understand these strategies.

Jennifer Wolf, Sustainable Building Partners
Sustainable Building Partners are a multi-disciplinary firm with three main departments within their sustainable programs department. They generally facilitate the certification process for projects under various green building rating systems. They have expanded their services to include carbon evaluations. A whole building life cycle assessment is an evaluation of the environmental impacts from the extraction, processing and manufacturing of raw materials all the way through to the end of life and disposal. In the context of the built environment, the predominant forms of life cycle assessments are at the material and whole building level. A whole building life cycle assessment quantifies impacts from cradle to grave and is the most comprehensive way to track embodied carbon. The whole building life cycle assessment covers the structure and enclosure materials. In the future, this will likely be expanded to cover more materials, such as flooring, interior walls, and other interior materials.

As with whole buildings, there are also ways to benchmark materials. Sustainable Building Partners currently use tools to identify and include global warming potential performance requirements in product specs. They also educate contractors on the building transparency catalog, to help them make better product selection. The industry is still adapting to include LCA conversations early in the design process. The industry is working to develop guidelines to improve quality, consistency, and comparability of the results, which in turn enables benchmarking.

Discussion:

- In terms of creating an embodied carbon policy that doesn't leave out small manufacturers, there are two major strategies. First, focusing on bigger projects, either over a certain budget or over a certain number of square feet, so that they have more purchasing power. An Environmental Product Declaration (EPD), is somewhere between $3,000 to $5,000 for the first time. That is where some of these state policies are including incentives or hardship clauses for small manufacturers. For example, New York has a $3,000 tax incentive for small manufacturers or there is a hardship clause.
- The term embodied carbon mainly applies to the built environment. It is not used as much with regard to non-building materials such as carbon associated consumer goods. Another way to think about embodied carbon is to think of it as scope three emissions related to purchasing.
- Relying on a building lasting for as long as the material lasts, then emission reductions won't be made because the building could get torn down early. But reusing a building provides the benefits of that long life material, which is why those EPDs are important. Once the product is made, those carbon emissions have already happened. Driving emissions down early in the process and getting low carbon options in the building makes a big difference.
- There is a hotly debated topic as to how to account for the carbon that is stored in carbon sequestering buildings, and the eventual release at the end of its life depending on how it is disposed of. Biogenic carbon, which is a product that sequesters carbon, stores carbon and

does not emit it into the atmosphere. For now, the guidance is that this should be calculated.
- It is important to think about how a material is used, not just to evaluate it on its own. By weight, a lot more concrete is used in a building than steel. Therefore, concrete tends to have an equal or higher building impact to steel just because of how much of it is used.

6. 2021 MEETING SCHEDULE AND ADJOURNMENT

Gina Mathias, City of Takoma Park (BEEAC Chair)

Chair Gina Mathias adjourned the meeting. BEEAC meeting dates for 2021 include:

- February 18
- April 15
- June 27
- September 16
- November 18

All meeting materials including speaker presentations can be found on the MWCOG website or by clicking the link below –
https://www.mwcog.org/events/2020/11/19/built-environment-and-energy-advisory-committee-beeac/

The next CEEPC meeting is January 27, 2021
The next BEEAC meeting is February 18, 2021