

City of Cambridge

CLIMATE PROTECTION ACTION COMMITTEE

Minutes

May 13, 2021

Zoom

*Attendees:* Melissa Chan (chair), Steven Nutter (vice chair), Tom Chase (secretary), Peter Crawley, Ted Live, Lyn Huckabee, Lauren Miller, Trisha Montalbo, Jerrad Pierce, Paula Phipps, Fred Hewett, Keren Schlomy, Rosalie Anders, David Rabkin, Keith Giamportone; *staff:* John Bolduc, Seth Federspiel

*Guests:* Andrea Love, Payette Associates; Mark Webster, SGH; Stephen Moore, SWA; Michelle Lambert, Lambert Sustainability

Approval of Minutes

Minutes for the April 8, 2021 were approved.

ETP Director Report

- 2021 Bike Plan updated to be published in June
- Resilient Cambridge update around June 17, 2021
- City Council passed Green Roof Ordinance requiring 80% of green roof or bio solar roof on available roof area for labs, commercial, and market rate residential, excluding mechanical equipment, municipal and affordable multifamily exempt
- Net Zero Task Force wraps up end of May, 2021
- June 9 City Council on Zero Waste Plan
- Councilor Zondervan introduced proposed ordinance requiring embodied carbon studies for new buildings
- DPW has officially launched the Urban Forest Masterplan – Healthy Forests, Healthy Cities summary document
- MIT released new climate action plan with new goal to be carbon neutral by 2026 and net zero by 2050

Embodied Carbon in Buildings

- John Bolduc presented an introduction to consumption based emissions in concept, and introduced the main topic and presenters (see presentation slides)
- Andrea Love presented an introduction to embodied carbon emissions from buildings (see presentation slides)
- Questions and discussion:
  - What is the main driver for embodied carbon (EC) in finishes? Part is the material itself, but then it has a very high replacement rate during the lifespan of the building
  - MEP drivers? Metals, refrigerants
  - Is the environmental impact of mining included in calculation? Yes

- What is the embodied carbon profile of the typical existing building stock in Cambridge, such as wood-framed residential buildings? One of the greenest things we can do is save existing buildings (and material), especially saving the structure, but operating emissions of existing buildings is worse, must be improved. Reuse is one of the best ways to reduce embodied carbon.
- To Build or Not to Build tool soon to be launched (within 6 months) – Lori Ferriss, Goody Clancy and Larry Strain to help make decisions about embodied carbon savings of adaptive reuse, will be free and available online
- Mark Webster presented on embodied carbon in structural materials specifically (see presentation slides)
- Questions and discussion:
  - Clarifying question on scale of carbon vs. steel impact shown in slides? Concrete dominates in graphs showing building construction in US, two impacts are more similar looking globally at buildings and infrastructure. Even rehabs represent some significant portion of concrete use.
  - Cement content of concrete, what are forces leading firms not to decrease cement? Partly a natural conservatism on design side in structural engineering, also on the production side with ready mix contractors wanting to roll out new products more slowly; performance is different with cement alternatives, for example slowing down the strength gain; concrete with SCMs in the long term perform better on strength and durability; limited/no added cost in material cost, but potential construction delay cost
  - Typical to use recycled aggregate? Typically virgin materials in this region, may be moving to more recycled aggregate
  - Concrete alternatives? Focus is more on reducing concrete given challenge of replacing cement component, even steel framed buildings have a lot of concrete typically for floors
  - Marin County standard, possible to implement? Seems to be a good starting place with not too much pushback. Applied to all building types and sizes? Unknown, need to learn more
  - Regulate at City level? Boston thinking is that because embodied carbon is not regulated by the building code currently, it's fair game
  - Where is Boston going next? Looking at this through zoning, similar to approach in Vancouver, but no other real examples. Article 37 revision to ZNC standard, including operating and embodied carbon, even if embodied carbon is only a placeholder.
  - Public vs. private buildings – most of the embodied carbon policy that has passed or is under review is for public buildings. PANY/NJ is looking at adopting for public infrastructure
  - CA requires EPDs to be produced to demonstrate that materials meet limits, e.g. only 6 structural steel producers in country, they have now all produced EPDs, about 90% of structural steel produced domestically
  - Any run-ins with state, have any municipalities acted yet? Newton Special Permit process embodied carbon narrative requirement
  - LEED credit model? Yes, encourages study first, and then reduction for additional points, good practice to include MEP as well, because if that is reduced, may create more of a whole picture even compared to lower-performing buildings

- What big measures make sense to go after first? What's the biggest impact for the lowest effort? Start with those big hit materials, concrete, steel, aluminum – so LCA for limited material subset
- Consider regulatory relief for building reuse, to avoid doing the study, need to add material and EC impact to conversation on demolition
- Amending demolition bylaws and ordinances to encourage reuse? Some energy around this but not action yet, potentially through disposal fees
- What is SWA seeing on embodied carbon? Can control building programming early on, can specify requirements early on, can you design to right size MEP, eliminate or reduce parking garages or reduce their size
- Tie together embodied carbon and performance and healthy buildings
- Municipal building choices, recent school demolitions and rebuild, what about saving foundation in those conversations? Reusing buildings always preferable, especially foundations, can be extremely challenging for design
- Health benefits for low embodied carbon materials? Creating healthier environment, but not necessarily in Cambridge, but elsewhere, as in EJ communities, a lot of materials are bio based materials
- Concrete in circular economy? Reuse of cast in place concrete far preferable to downcycling, demo and reuse option for concrete is only downcycling, steel and aluminum are endlessly reusable. Design for deconstruction and reuse is emerging and growing trend, even potentially with re-useable precast concrete members
- How does CMU compare to cast in place concrete? Composite material, grout, rebar, etc.
- What's the next step forward on LCA? Adopting someone else's standard and focus on structure and enclosure early.

### Member Reports

#### Lyn Huckabee

- EEAC doing several public comment sessions on state of energy efficiency, Lynn to share with John for including in newsletter

#### Tom Chase

- DHCD released 2022-2023 QAP, weak on energy, no mention of embodied carbon, reach out to Tom if interested in submitting a response due next week

*Notes by Tom Chase*