CITY OF KNOXVILLE
Mayor's Climate Council

Climate Council Meeting - Energy & Buildings Strategies
Tuesday, September 8, 2020 – 1-3 PM

1) **Welcome** (Mayor Kincannon)
   a) Attendees
      i. Mayor Indya Kincannon, City of Knoxville (in person)
      ii. Erin Gill, City of Knoxville (in person)
      iii. Brian Blackmon, City of Knoxville (in person)
      iv. Luke Gebhard, Milepost Consulting (in person)
      v. Erin Rose, Three^3 (by Zoom)
      vi. Steve Seifried, Ameresco (by Zoom)
      vii. Gil Hough, TenneSEIA (Tennessee Solar Energy Industries Association) (by Zoom)
      viii. Michael Davis, American Institute of Architects East TN (by Zoom)
      ix. Josh New, Oak Ridge National Laboratory (by Zoom)
      x. Alicia Hemmings, Sunrise Movement (by Zoom)
      xi. Amy Hathaway, Forest Heights Neighborhood Association (in person)
      xii. Cortney Piper, Tennessee Advanced Energy Business Council (by Zoom)
      xiii. Gabe Bolas, Knoxville Utilities Board (by Zoom)
      xiv. George Wallace, Coldwell Banker Wallace (by Zoom)
      xv. Nancy Nabors, Knoxville Chamber (in person)
      xvi. Rebecca Tolene, Tennessee Valley Authority (in person)
      xvii. Stan Johnson, Socially Equal Energy Efficient Development (by Zoom)
      xviii. Maggie Shober, Southern Alliance for Clean Energy (by Zoom)

2) **Equity Working Group Update** (Erin Rose, Three^3)
   a) We introduced 9 High Impact Practice transportation strategies to the EWG last week. Now we are shifting the focus to community engagement from each EWG member on those strategies, leveraging their respective networks.
   b) Focused on developing criteria for evaluating equity impacts of those strategies, going forward we will look for opportunities to use those criteria in evaluating strategies from the other categories (Energy, Waste)
   c) Erin Gill: We are looking at these strategies in a new way, through the equity lens, and so would like to thank the equity working group members for their work in balancing the structure of the strategies with lived experience of the community.

3) **Transportation Working Group Report Out** (Brian Blackmon, City of Knoxville)
   a) All Climate Council members are allowed (but not required) to participate in the technical working group meetings to learn more. The last technical working group meeting (transportation strategies in August) had 22 participants.
      i) Working group spent a lot of time trying to define scale of impacts—cost, mitigation, time to implement.
      ii) Sent a survey after the working group meeting to try to understand what concrete actions people think are appropriate under the respective strategies.
      iii) It's important to understand this as an iterative process, our understanding of the discussions will evolve together. Surveyed strategy rankings are not meant to be final results or a substitute for discussion.
      iv) Brian reviewed rankings of 14 Energy & Buildings strategies.

v) Insights from the rankings: Efficiency retrofits are the bulk of the top quartile. There was more debate in these rankings vs. the transportation strategies – significantly more "not important" votes compared to transportation and waste. Interestingly, technical working group members ranked "above code" building measures much higher than Climate Council members.

4) **Panel Presentations** (Milepost Consulting, City of Knoxville)
   a) Steve Seifried, Ameresco – Energy 101
      i) Knoxville has a very concerted effort and strategy on sustainable energy. The opportunity and environment for investment is good. The concept of avoided cost has guided the strategy thus far. There is a certainty and benefit to knowing what your long-term energy costs will be.
      ii) Centralized vs. Decentralized (distributed) energy resources (DER): Traditionally, one large plant is centralized for generating and transmitting energy across large distances. DER allows generation to happen across a network (Solar PV), can produce and feed energy into the grid.
      iii) Costs/Value of DER- There is not one consensus on the costs/benefits, however we know that there are several significant benefits today, such as avoided energy costs from solar PV and certain targeted environmental benefits. The biggest question we have to answer are what investments should be made now, rather than 20 years from now.
      iv) Q&A
         (1) Erin Gill: What are some of the areas lacking consensus, do we have any consensus [within the industry] on these issues?
            (a) Steve Seifried: There is non-consensus on the specifics of targeted benefits, as well as reliability and resiliency for customers and the grid.
   b) Gil Hough, TenneSEIA - Renewables
      i) Solar is booming currently – cost has come down dramatically. TVA has 1500 MW of solar operating or under contract.
      ii) TN currently has nearly 5,000 solar jobs – there is significant economic opportunity here in Knoxville.
      iii) KUB would be the energy partner in Knoxville. They signed a contract with TVA that 5% of their load can be generated locally, translating to solar capacity of 80 MW.
      iv) KUB negotiated first of its kind Green Invest program that secured 212 MW.
      v) Well-designed time-of-use rates could create a win-win for customers and their business.
      vi) What is missing: A perfect program would let you take advantage of the Investment Tax Credit (ITC), TVA Green Connect Solar Installer program, etc.
      vii) Invitation to TN Valley Solar Conference October 7.
   c) Michael Davis, AIA East Tennessee – Building Design
      i) More than 40% of US GHG emissions can be attributed to the building industry.
      ii) AIA has goal of net-zero emissions in building sector by 2030 for all new buildings, developments, and major renovations shall be carbon neutral by year 2030.
      iii) Retrofitting buildings strengthens local economy. AIA ET supports policies that promote climate-sensitive design and adaptation for all new and existing buildings, policies and regulations to incentivize significant reductions in operational and embodied carbon, and developing comprehensive strategy for promoting high performance buildings (Zero code/stretch code).
      iv) Focusing on passive design solutions is critical. Minimizing solar heat gain is one example.
      v) Passive design in the design stage is critical, because it's something that can't be changed or added in later.
      vi) Q&A
         (1) Mayor Kincannon: Are most/all architects aware of standards such as passive design?
            (a) Michael Davis: Yes, to the degree that we can actually act on those steps depends on the client. Starting with passive strategies is definitely an industry standard. Building energy modeling (BEM) is becoming more standardized now. What happens with existing buildings is evaluating most cost-effective retrofits, which needs to happen on a case-by-case basis.

d) Josh New, ORNL Building Technologies Office – Building Performance & Energy Modeling
   i) Building energy modeling allows us to determine what technologies are most cost-efficient to reach our goals of energy use reduction.
   ii) Under certain IPCC scenario (A1FI), weather that is seen in TN today will be seen in Michigan in 80 years.
   iii) DOE has invested over $100M to develop computational tools that model/monitor energy use. These tools are used by many users, including some of the world's biggest HVAC producers.
   iv) Goal of modeling project: create digital twin (model) of every U.S. building by end of 2020. These models should be free and openly available for cities to be able to see energy use of buildings in their jurisdiction.
   v) BEM allows architects/developers to create deep energy efficiency results.
   vi) Created building energy model for EPB (local power provider) in Chattanooga for 178k buildings.
   vii) Using these models would be very useful for determining feasibility of various strategies in seeing deep reductions in energy use for a long-term goal.
   viii) Q&A
      (1) Erin Rose: Can you frame energy savings in terms of low-income housing stock?
         (a) Josh New: At the DOE level, there has been a lot of equity discussion, but not a lot of action. One thing that was done with EPB, there was modeling of all buildings, however they had a separate database of 20+ categories that allowed them to zoom in on energy-burdened households for use in their own programs.
      (2) Maggie Shober: Who was the project funded by? For the emissions reduction potential, how was that calculated?
         (a) Josh New: Funding from Building Technology Office, EPB provided cost share ~500k. EPA database was used for emissions from certain source and region. Keeping in mind that generation in different regions and different times of day will be dirtier/more carbon intensive, because of how much load is on the grid. This is something that the utilities are aware of and working on, to reduce cost. Making sure our management of peak-load is efficient and cleaner is important, especially as more appliances become electric and load grows in the future.
      (3) Maggie Shober (chat): TVA's highest and most often peaks are still in the afternoon in the summer, so the "duck curve" is a ways away in this region
         (a) Gil Hough (chat): agreed - the duck curve has yet to be in issue in Tennessee
      (4) Steve Seifried: Linking avoided costs to deferred maintenance and capital investments decisions is powerful, rather than thinking of each in their own silos.
      (5) Josh New: Energy storage is a big player coming up in the future. There will be a big push also for connected devices, smart thermostats are a good example of smaller investments that can be made on the load demand side.
      (6) Erin Rose (chat): I believe there are equity issues related to time of use rates that need to be considered.
         (a) Maggie Shober (chat): Yes Erin, accessibility to the kinds of technologies needed to participate (i.e. nest thermostat), needed to communicate (i.e. how would KUB tell customers that a peak is coming up and to reduce usage), and ability to turn down usage if usage is already minimized to minimize bills.

5) Facilitated Discussion

a) Luke Gebhard: Switching gears from Q&A, setting ground rules for discussion: limiting discussion to GHG mitigation strategies for Energy & Buildings – other topics are pinned to the "parking lot". We are primarily looking to identify points of leverage for each strategy.
b) Luke presented ranking of high-impact practices/strategies
   i) Create voluntary large commercial and multi-family energy upgrade program(s) (eg. incentives, technical assistance) that achieve deep energy savings (~25%+) in ~20%+ of large buildings
   ii) Enact market incentives (eg. zoning or financial) that achieve ~25%+ better energy performance than existing local code in new building space

iii) Create voluntary home energy upgrade program(s) that will achieve deep energy savings (~25%+) in 20% of homes
iv) Create voluntary home energy upgrade program(s) that will achieve moderate energy savings (~10%+) in 40% of homes
v) Create voluntary large commercial and multi-family energy upgrade program(s) (eg. incentives, technical assistance) that achieve moderate energy savings (~10%+) in ~50%+ of large buildings
vi) Develop a local strategy and enact programs to drive thermal decarbonization/electrification (eg. replacement of fossil fuel-fired furnaces, boilers, and domestic hot water systems with electric heat pump technologies or other renewable options) of existing buildings over time
vii) Establish a community-shared renewable energy program (eg. community solar) at a scale engaging ~5%+ of community members
viii) Require and/or encourage large commercial buildings over 25,000 square feet to conduct audits and/or retro-commissioning
ix) Develop/enhance programs that allow customers to purchase renewable energy through local utilities
x) Require and/or encourage large multi-family buildings over 10,000 square feet to conduct audits and/or retro-commissioning
xi) Require large multi-family buildings to report their energy performance
xii) Require large commercial buildings to report their energy performance
xiii) Adopt new ordinances or building codes to promote solar-ready construction in buildings over 10,000 square feet
xiv) Develop a building staff training program with large privately-owned commercial and multi-family buildings and/or require building staff be trained in energy efficiency best practices

c) Facilitated discussion
i) Luke Gebhard: share general reactions (what is the City well-positioned to do currently, how can we involve private sector leadership, etc) as well as challenges/barriers and opportunities (resource limitations, investment sources, time parameters, critical stakeholders)
ii) Brian Blackmon: The scores/rankings between strategies focused on an X% energy reduction across X% homes were all fairly high, and the emission reduction potential between them is nearly even. The question will be whether it makes more sense to touch more homes with less savings in each, or fewer homes and get greater savings from those.
iii) Mayor Kincannon: From the development community perspective, which strategy from the above would be most effective?
(1) George Wallace: Market incentives for developers to install energy efficiency measures will be very important, same goes for residential/home improvements. They have worked well in the past, developers will continue to respond positively to incentives.
iv) Erin Gill: efficiency was ranked higher than most other strategies – is that because we see it as the most effective, or because we think it is critical no matter what, and should be bundled with other strategies?
(1) Josh New (chat): The U.S. has 125 million residential and commercial buildings, and builds ~1 million per year. With less than 1% turnover, existing buildings will need to be targeted for 80% by 2050.
(2) Maggie Shober: All strategies are important, however we need to focus on decarbonizing quickly, have to focus on existing buildings. One big thing we can do is remove incentives for gas (we should be only pushing for electric).
v) Mayor Kincannon: Are there opportunities for a private entity to be a leader in some of these investments/strategies? Money is a powerful incentive – how do we get developers who build/renovate to focus on climate issues when they are passing the building on to other owners.
(1) Erin Gill: Taking data and tools and using them to focus on specific areas/strategies will be critical.
(2) Josh New: The energy use simulator is available first quarter of 2021. Modeling will be able to model emissions savings across retrofit packages or individual technology. This is focused on existing buildings.

(3) Brian Blackmon: We are working with Knox Planning to estimate urban growth/development patterns and modeling building footprint to estimate potential adoption.
(4) Stan Johnson: Can you incentivize builders by saying Energy Efficiency/renewable investments will raise appraised value of the construction? Is there a policy that can create this, to capture value from savings/emission benefits?
    (a) George Wallace: Lowering expenses raises your profits. Builders will not implement these measures on a voluntary basis, there has to be ROI. Rates of return on investment are not always great when discussing some of these improvements, and that makes some high cost items less attractive to install.
(5) Maggie Shober: Important to think about how you incentivize things – there are innovative measures, such as on-bill financing. There are other ways to look at it that might be useful across the diversity of demographics in the city (single-family rental, multi-family, commercial, etc.)
    (a) Rebecca Tolene: Higher-income folks are more able to take advantage of existing incentives, usually, so we do need to be more creative about how we structure incentives to get more buy-in.
    (b) Erin Gill: "Green building" certification marketing is big for some companies, however they don't always go through official channels. We could use other channels to get them recognition, and/or define our own suite of retrofits that qualify under our own standards. LEED and others can be a big hurdle/process.
    (c) Mayor Kincannon: Getting them recognition through some feature or award like Keep Knoxville Beautiful's Orchid Awards might be an opportunity.
    (d) Amy Hathaway: NWF Certification is something that gets residences certified, if there could be an equivalent for energy efficiency, people might be interested.

vi) Erin Rose: TVA Home Uplift doesn't operate on savings/investment ratio, they state that it falls within their mission that home comfort and energy affordability are things they look to ensure for customers within their service territory. For folks at the poverty threshold, there is a very high energy burden within the Southeast region. If we are not able to directly address energy burdens for their own sake in terms of human rights, not just for investment.
    (1) Erin Gill: The City historically has a firm foundation of linking energy efficiency with housing affordability through KEEM and other efforts. This is something to continue to focus on for all stakeholders, KUB, TVA, City, etc.
    (2) Stan Johnson: The waiting list for weatherization is concerning, because it is so large and growing. We need to seriously think about the scale at which we need to address weatherization and home efficiency measures. If we are thinking about the scale of investment needed for future impacts, that list will be significantly increased.
    (3) Brian Blackmon: What I'm hearing is that there might be a discomfort/unease with commercial and industrial strategy because of lack of ROI. When going back to residential, we need to touch a significant amount of homes – of course we need to prioritize low-to-moderate income (LMI) households, but we also need to get into higher income households in order to see real emission reductions in the future. We have to go deeper than just LMI (low-moderate income) households.
    (4) Mayor Kincannon: For those higher-income individuals, we need to address incentivizing changes in their homes when they are less affected by energy burden/bills.

vii) Luke Gebhard: It sounds like there's a need broaden the scope of this discussion into the wider GHG mitigation picture i.e., focus on other sectors for energy savings, beyond residential.
    (1) Maggie Shober: Home Uplift is a good start, but it has a narrow reach and long waiting list. We also need to focus outside of residential for those who are energy burdened, i.e., small businesses. Many businesses don't have the knowledge or means to implement EE measures sometimes. There has to be a push to prioritize these types of locations.
    (2) Brian Blackmon: Industrial is the lowest emitter from buildings in the city, commercial is the highest.

(3) Josh New (chat): Nationwide, residential is 54% of energy use, commercial is 46%. If you made the entire residential building stock net-zero, you still wouldn't get to 80% GHG emission reductions. By number of buildings, 96% of buildings are residential, 4% are commercial buildings. Bang-for-your-buck, traditional energy efficiency programs focus solely on commercial.

viii) Erin G: I'm hearing that efficiency is the priority for investment, as opposed to renewable energy or other strategies.

ix) Rebecca Tolene: Balancing investments in energy efficiency and maintaining rates that customers have to pay is difficult. We are attractive for commercial property owners in part because of our rates.

(1) Nancy Nabors: COVID-19 is impacting commercial property owners in terms of all of these workers telecommuting now and office space being in lower demand. We should expect development to occur slower and less money being spent in property development.

x) Stan Johnson: It seems important to create partnerships across all stakeholders in the community in order to achieve all of these strategies: beyond CoK, KUB, etc. because seeing deep reductions will take all of them.

6) Wrap-up & Next Steps

a) Next meeting: Energy & Buildings technical working group on October 13 from 1-3PM.