

Climate Change, Energy, and Environment Commission (C2E2)

Summary of April 24, 2023

Hybrid Meeting

Members Present: Joan McIntyre (Chair), Carrie Thompson (Vice Chair), Cindy Lewin, Jonathan Morgenstein, Mark Greenwood, Mikaila Milton, Kevin Vincent, Doug Snoeyenbos, Majdi Shomali, Stephen D'Alessio, Rob Sendou, Eric Gibbs,

Members Present Virtually: Joshua Griset

Members Absent:

Guests Present:

Guests Virtually: Dorothea Antonio (Neighborhood College); Gary Shinears (Neighborhood College); Francella _____ (Neighborhood College); Jamie Hood (Neighborhood College and Arlington Community Foundation); Judy Collins (League of Women Voters); Pamela Barr (Neighborhood College); Ruth Woolett (Sierra Club); Susan Swing (citizen interested in possibly applying for a seat on C2E2); Katherine Roberts (no affiliation); Ted Tiffany (Building Decarbonization Coalition)

Staff Present: Demetra McBride (DES), Richard Dooley (DES)

1. Introductions and Public Comment

No public comment. Cindy Lewin made short introductory comments regarding Ted Tiffany and this evening's presentation on decarbonization of buildings.

2. March Meeting Minutes

Meeting minutes for March 2023 were reviewed and unanimously approved.

3. Decarbonization of Buildings (Ted Tiffany, Building Decarbonization Coalition)

Cindy Lewin introduced Ted Tiffany, Senior Technical Director of the Building Decarbonization Coalition (BDC). She was introduced to Tiffany through her work on the Americana Project SPRC through the developer, JBG Smith. Using the Americana as an example, Lewin set up the discussion, noting that often site plans are approved with fossil-fuel elements included, based on issues of feasibility, or that Virginia law (as staff notes) prevents electrification mandates. Lewin noted that Ted and the BDC are based out of California and that California laws and regulation are different, but welcomed Ted's guidance on how the Commission might engage developers to use non-fossil-fuel options in building design, especially for HVAC and hot water systems.

McBride provided Tiffany with a brief overview of Virginia challenges, noting that Virginia has no home rule, that local governments are bound by the State Building Code, which is not progressive. Also, if time remained, McBride asked Tiffany if he could brief the Commission on the recent court decision that suspended the City of Berkeley's mandatory electrification regulation.

Tiffany prefaced his presentation by stating that he would generally review technologies and options for building electrification, and review the 9th Circuit decision because the BDC also consults on IC Codes and local building code and policy development is another application that the BDC serves. Tiffany added that his presentation would focus on commercial buildings, although the BDC does extensive work on residential, from single-family homes to multi-family buildings.

Tiffany reviewed his background, having recently sold his engineering firm after 15 years of designing buildings from homes to hospitals, as he also volunteered for the BDC with a focus on policy development and education. BDC's approach is comprehensive, promoting technology that can be brought to make, consulting on supporting policy, and producing educational programs that promote success in bringing developers and contractors to decarbonize buildings. There is a strong supporting business case, as we have experienced price volatility in the fossil fuel markets and increases in infrastructure costs and we can take advantage of broad need for new investments to replace aged or failing infrastructure. In addition, resiliency and public health such as indoor and outdoor air quality are key issues.

Also, new infrastructure creates local jobs, and resiliency means we can mitigate risk, which allows for price stabilization.

Tiffany noted that his work often focuses on existing buildings, especially with regard to heat pumps which are currently available on the market in a wide variety of scale. The market has seen significant technological advancements in just the past few years, evidenced in our recent attendance at the Advanced Heating and Refrigeration Institute Conference. From what we use in our homes, to small commercial and multifamily buildings, integrated heat pumps are more available. Even larger-scale package rooftop units.

Also, water-cooled units – what we traditionally used for building cooling. They do have and are still applying these large heat recovery chiller applications, and networking them with geothermal systems.

Tiffany then reviewed work by NREL, the National Renewable Energy Laboratory, in modeling and testing thermal energy district planning; combining a series of streams that start with G1 (conventional steam), low- and high-temperature water loops, and heat recovery applications automated with heat pumps - which are transitioning thermal energy networks away from traditional natural gas systems.

Moreover, this supports upscaling systems using geothermal to reach from neighborhood to municipal-scale applications. For example, Minneapolis is piloting geothermal on 415,000 square feet of development over 122 acres. These are large-scale electrification projects. And in New York is conducting a number of thermal-energy pilots to test non-fossil fuel energy-driven plants. And even certain utilities are in negotiations to test their own geothermal commercial-scale networks.

Celebrity chefs are promoting new electrification technologies for commercial kitchens, for example in San Francisco, with an interest in both power source and public health impacts. Microsoft has converted its campus kitchens to electric appliances, without any need for menu changes. They (BDC) have resources and a guide that covers commercial kitchens, the unique aspects of multifamily construction, hotel, motel, large buildings of campus scale, and residential. People are freely sharing their experience, lessons learned, and successes, so the resources and education are out there and growing. Education is a key to increased decarbonization, and BDC offers a blog, education sessions, manufacturer sessions, and policy calls that cover states like Maine that are leading in policy, and how to streamline codes and standards for decarbonization.

BDC has also put together a white paper on how to best take advantage of the incentives under the IRA. Then, Tiffany opened up the discussion for questions:

Q: Hi, I'm Carrie, and would like to discuss whether BDC has worked inside Virginia (Gary notes that Cindy Lewin is shaking her head), and then how should we contend with the Dillon Rule and an older mindset that gas or hybrid systems are necessary to heat water, especially in taller buildings.

A: Yes, Cindy and I have spoken about this. I think a big step is just getting the education and materials in the hands of building designers and get them to really leap-frog that learning curve. This particular issue is common – how to manage domestic hot water in a high-rise. We are working now with partners, including Ecotope, to share their experience and lessons learned in a couple of their high-rises and the technologies they applied. Again, they are open to sharing their knowledge. Also, ASHRAE is currently developing design guidance but, before that is ready, implementers are available. Regarding Virginia policy, we have not been yet active in Virginia, but willing to lean in and

work with you.

Q: [REDACTED] (not sure who posed this question) – Could you speak to your work with municipalities, and I believe you have a mayoral coalition? We are an advisory commission to the County Board and would like to know how you approach that audience?

A: Yes, my role now is predominantly in California policy, and that has taken two forms: one, bringing together our partners in closed sessions to develop a strategy on how we are going to respond to the Berkeley decision. In addition, we're convening did some public meetings and discussions among municipalities to help coach those who were and are considering similar policy and the implications of that. That almost becomes a legal effort, but a strategic one.

Q: Can I ask a follow-up question: Do you have something like a "municipalities best practices" guidebook?

A: So on our website, we have the Compass, and that shares policies that have been adopted around the country, and layering that with IC language for electrification. Our policy tracker lists other jurisdictions, their electrification policy, their code language – so you do not have to reinvent the wheel.

Q (Joan McIntyre): A common issue we encounter relates to space issues – the belief that you cannot design for centralized hot water or heat pump hot water systems unless you set aside more spaces for expanded systems, or that the number of floors in a high building may require construction of two systems for a single building. And that becomes the standard approach here. Do you encounter that thinking and how do you get developers to start thinking differently about that, and is it actually as big an issue as they believe it is?

A: It really is a very technical issue in high-rise buildings because the separation of the towers really occurs with any kind of mechanical system, and you have to design for that from the outset. And a lot of projects are challenged because they need to be designed for electrification from the outset, and not redesigned. Schematic design for electrification from the outset makes this easier, but we see a majority of projects that are coming in late in design and the pivot at that point is challenged – tough decisions need to be made and space is one of those decisions. But that should not happen if you plan for it from the beginning. And some of that is not understanding the technologies and the balance between thermal storage and the actual heat pumps themselves, and understanding the technology. It is a deep engineering discussion that we have to bring to education – to get that deep technical expertise into the designer's hands from a trusted resource so the discussion is not confrontational.

In California, certain Community Choice Aggregation agencies have brought in a form of "peer review" for projects, using engineers from outside the design firms, to answer questions the design firm may have about permitting or electrification strategies.

Q: (Cindy Lewin) So as a case study or example, Ted, when you were speaking with JBG Smith – who is one of the leading developers trying to decarbonize their buildings and operations nationwide – did you determine that they were open to new strategies, or that they may have been stumped on how to implement the technologies?

A: Well, let me go back to my prior life. My firm was one of 5 engineering firms that formed a peer or consultation body to advise municipalities on how to design for electrification while meeting their permitting ordinances, etc. We would go in early on schematic design and help them. These were areas where they already had already adopted electrification ordinances and we helped walk them through that – that is one approach.

Q: (Demetra) So Ted, a quick set-up for this question. We do not have home rule, so for 20 years Arlington has implemented a Bonus Density Incentive Program for developers to voluntarily adopt reach measures for design and construction. The Program and ordinance have been updated 7 or 8 times, each time just increasing the LEED standards which, we have come to realize, do not deliver as advertised for energy. More importantly, as you have noted, we get to review new construction design when it is at least at 30% design, and too late to expert developers to start over. So in the upcoming update to the Bonus Density Program, we are going to build in 6 months of education – for developers, architects, design firms, builders – do you have any materials on your website or available that we

could incorporate into that, because we think the education could be a game-changer. Also, when you refer to geothermal, have you had the opportunity to apply that to space-constrained, densely-developed urban areas, because we commonly encounter a lot of other infrastructure underground?

A: Well, ground source heat pump applications come in different flavors – for example, your underground resource could be the sewer wastewater. Also, a lot of urban infrastructure is failing, and when you go in to upgrade or replace that, you can install dual systems when you need to install new water lines, new sewer lines, or new gas lines. There is a great opportunity – while you have the open trench – to include a new wastewater geothermal tide system. Otherwise, yes, you are going to be challenged on underground conflicts, but then you can also look to opportunities for air source heat systems and other opportunities.

Q: (Jonathan Morgenstein) Can I follow up on that please. I work for NREL and while I am not directly involved there, NYSERDA is doing case and feasibility studies for district ground-source heating and cooling and that is in your Slide 11. And you do not get more dense than New York City. But if you are going to construct a building over a metro line or station, you likely will not be able to fully resource ground source heating or cooling. But do you have an example elsewhere of a comparable city that has developed an alternate approach?

A: Yes, you're right. We are not directly involved in the New York projects, which are pilot projects of new applications to see which thermal energy networks are appropriate for which neighborhoods.

In most cases, geothermal will not be the right thermal network. But, you know, the City of Vancouver for example, they have a complete district thermal plant that is running off biogas as a solution for their thermal network, and they are doing recovery off the wastewater that is coming back to the central plant. The only thing they are changing is the source of energy at the district plant, so that is another application. Another challenge in these cities is the historic design of older buildings that are running at certain temperatures and a new adjacent building on the same parcel has completely different engineering.

Q (Morgenstein) But isn't that a surprise benefit if you can off-load heat from one building into the next?

A: Yes.

Q (Thompson) Another challenge we have is that developers often seek to meet reach standards and find the utility rejects their load letter, which is based on higher electrification in a grid that is insufficient to meet the demand. Do you have any recommendations for how to engage the Utility on this issue?

A: This is a common challenge nationally, and we see a lot of regulatory agencies raising this issue. We are engaging a number of the major electricity utilities here on the West Coast to facilitate that discussion. It is important first to define and identify what is an impacted zone – and where can we electrify without a large-scale expansion of the grid infrastructure. For the first time here, we have a major utility that is overlaying their natural gas infrastructure planning, but that is a case where one utility controls both electricity and gas. Different states and jurisdictions are different – you can have different utilities controlling each, or different regulation, or you can even have municipal utilities or a municipal utility that controls one but not the other. This is a major issue but it all starts with bringing parties to the table and barnstorming ideas and solutions.

Q (McBride) So is there a stack of approaches that can be deployed to reduce the demand that is focused on the electric power utility?

A: Yes. I have had this discussion with building designers where, for example, you start off with electric resistance boilers and then, as a thought exercise, you say, what could we offset with heat pumps, and then again with air source recovery? That might avoid the infrastructure upgrade required at the panel or distribution level? But really, the challenge is in electrification of transportation – the demand issue is more problematic with EV charging infrastructure than the building electrification.

Q (Please help me identify who posed this question) Wondering what you are doing there, specifically, and for whom, given all the tax credits and incentives programs coming out of the IRA?

A: Yes, and I am going to place this in the Chat section, a link to our IRA White Paper, which really focuses on our lessons learned from prior projects. It is really educated guidance.

Q (McBride) Ted, quickly, when you previously mentioned working with the utility on projected demand and the grid, I am assuming you were referring to PG&E. Have they become voluntarily more transparent on these questions, or is the regulatory agency, the CPUC, forcing that level of engagement and disclosure?

A: Well it is really coming out of a PG&E large-scale campus pilot in the Monterey area, where they are pulling back off their gas systems and electrifying but also upgrading their gas lines because they will still have to maintain that system. So, in the course of the pilot, there will necessarily be a lot of data and information disclosed.

Q (Joan McIntyre): Maybe one or less to summarize the Berkeley decision to see how that might affect other jurisdictions?

A: Okay, well it is in the 9th Circuit and the court has not issued a stay, but the expectation is that the court case will force Berkeley to make changes in their gas ban strategy. The initial ruling was pretty broad so interpreting the precise scope or all implications is difficult. The immediate impact has been that a lot of leading jurisdictions are considering their authority to adopt these kinds of ordinances so they are putting their enforcement on hold and waiting for the Berkeley case to play out. BDC is working on a legal opinion based on the Circuit's first action, and what alternatives local jurisdictions may have.

4. Discussion with Bill Eger

The Chair welcomed Bill Eger, the County's new Policy Officer, noting that the Commission had worked for two years to have this office established and to express the Commission's eagerness to discuss Mr. Eger's plans for the work of the office and outcomes.

Mr. Eger opened by thanking the Commission for the invitation to address them, and to share his early impressions and focus.

There is an opportunity to state the Commission's bandwidth for any given topic/program area in the work plan.

Carrie: SPRC process to make Commission work more efficiently and hit the applicant early with the checklist may help the applicant addressing comments. Having comments at the beginning helps influence the process.

The commission reviewed and motioned to approve the 2023 Work Plan.

5. Letter Reviews – Arlington Career Center

Commission noted that it is good to be specific in these letters. Charging infrastructure, not fully exhausted on-site solar, etc. EV chargers on-site is modern technology and highly educational for students. This is what's unique about Discovery Elementary School.

Add (+) one paragraph at the beginning, or the end, stating the students at the school are trained in these technologies and this is the future of energy.

The Commission reviewed and approved this letter.

6. Round Robin – Updates and Comments

Several vacancies for the Commission coming soon.

Missing Middle – The County has not passed the amendment for the request to advertise. The Board is still hearing public comments.

County Manager's Budget meeting: there is a \$38 million shortfall. Budget will be released next month, with a decision in April.

Commission to think about reiterating the County purchasing zero-emission buses. Writing a letter in response to the ARTBus Feasibility Study. Kevin and John will draft this letter and address the assumptions and see the whole lifecycle cost estimates.

Meeting ended: **9:15 p.m.**